is the group obtained by releasing protons from the proton-donating group and is bonded to the silicon atom contained in the same molecular to form the chelate structure. Similarly, each of "Y4" and "Y5" is the group obtained by releasing protons from the proton-donating group and is bonded to the silicon atom contained in the same molecular to form the chelate structure. Each of "X2" and "X3" is the same or different from each other. Each of "Y2", "Y3", "Y4" and "Y5" is the same or different from each other. A group represented by -Y2-X2-Y3- or -Y4-X3-Y5- in the general formula (4) is composed of a group obtained by releasing two protons from a proton-donor. As the proton-donor, it is preferable that, for example, an organic acid containing two or more carboxyl groups and/or hydroxyl groups, more preferable that an aromatic compound containing an aromatic ring and two or more carboxyl groups or hydroxyl groups each bonded to carbon atoms constituting the aromatic ring, and even more preferable that an aromatic compound containing an aromatic ring and two or more hydroxyl groups bonded to adjacent carbon atoms constituting the aromatic ring.

[0044] Concrete examples of such an aromatic compound include catechol, pyrogallol, 1,2-dihydroxynaphthalene, 2,3-dihydroxynaphthalene, 2,2'-biphenol, 1-1'-bi-2-naphthol, salicylic acid, 1-hydroxy-2-naphthoic acid, 3-hydroxy-naphthoic acid, chloranilic acid, tannic acid, 2-hydroxybenzylalchol, 1,2-cyclohexanediol, 1,2-propanediol, glycerin and the like. Among these aromatic compounds, the catechol, the 1,2-dihydroxynaphthalene or 2,3-dihydroxynaphthalene is preferably used.

[0045] Further, "Z1" in the general formula (4) is an organic group having an aromatic ring or a heterocyclic ring, or an aliphatic group. Concrete examples of such an organic group include an aliphatic hydrocarbon group such as a methyl group, an ethyl group, a propyl group, a butyl group, a hexyl group or an octyl group; an aromatic hydrocarbon group such as a phenyl group, a benzyl group, a naprthyl group or a biphenyl group; a reactive substituent group such as a glycidyl oxypropyl group, a mercaptopropyl group, an aminopropyl group or a vinyl group; and the like. Among these organic groups, the methyl group, the ethyl group, the phenyl group, the naprthyl group or the biphenyl group is preferably used. This is because these groups can improve thermal stability of the adduct represented by the general formula (4).

strength degradation of the cured resin composition for encapsulation. An upper limit of the amount of the inorganic filler contained in the resin composition constituting the resin compact of the present invention with respect to the total amount of the resin composition is preferably equal to or less than 93 wt%, more preferably equal to or less than 91 wt%, and even more preferably equal to or less than 90 wt%. By setting the amount of the inorganic filler to be equal to or less than the above upper limit, it is possible to allow the produced resin composition to have superior fluidity and moldability. In a case of using an inorganic flame retardant such as an aluminum hydroxide or a magnesium hydroxide; a boric acid zinc or a molybdenum acid zinc, it is preferable to set a total amount of the inorganic flame retardant and the inorganic filler within the above range.

[0049] The resin composition constituting the resin compact of the present invention contains the epoxy resin, the curing agent, the curing accelerator and the inorganic filler. If necessary, the resin composition may contain a flame retardant such as a brominated epoxy resin, antimony oxide, phosphoric acid ester, phosphazene, aluminum hydroxide or magnesium hydroxide; an ion scavenger such as hydrotalcite; a coloring agent such as carbon black, colcothar or titanium oxide; a natural wax such as carnauba wax; a synthesized wax such as polyethylene wax; a release agent such as a higher fatty acid or metallic salt thereof (e.g., stearic acid, zinc stearate or the like) or paraffin; a stress reducer such as silicone oil or silicone rubber; a silane coupling agent; or the like.

[0050] Next, description will be given to the method for producing the resin compact of the present invention by explaining an example method for producing a resin tablet (compact) for encapsulation.

[0051] (Kneading and mixing process)

This process is a process for preparing a first powder material obtained by mixing, heat-melting, kneading and crushing a first component containing the epoxy resin, the curing agent and the inorganic filler, but not containing the curing accelerator.

[0052] The first component is composed of all materials contained in the resin compact other than the curing accelerator. The kneading, heat-melting and kneading

or higher than melting temperatures or softening temperatures of the epoxy resin and the curing agent.

[0059] Among these machines, it is preferred that the jet mill, the ball mill or the pot mill is used for pulverizing the second component, and more preferred that the jet mill is used for pulverizing the second component. This makes it possible to effectively pulverize the curing accelerator and easily set a particle size of the second powder material to fall within the above range. Further, it is possible to prepare the second powder material so as not to allow the second powder material (the second component) to be heated at a temperature equal to or higher than melting temperature or softening temperature of the curing accelerator.

[0060] Each of the Win mill (made by Sansho industry Corporation) and the Mighty mill (made by Sansho industry Corporation) is a pulverizing machine used for preparing the first powder material which can finely pulverize the kneaded first component (the kneaded material) by crushing the kneaded material against a plurality of blades for pulverization.

[0061] The KRYPTON Zepros (made by Earthtechnica Corporation) is a pulverizing machine used for preparing the first powder material which can finely pulverize the kneaded first component (the kneaded material) between a rotor and a liner with shearing force and frictional force. As shown in FIG. 2, the KRYPTON Zepros includes a casing 8, a rotor 1 having a plurality of grooves, a motor 5 for rotating the rotor 1.

[0062] The casing 8 has an interior wall, an inlet 3 provided at a lower side portion of the casing 8, an outlet 4 provided at an upper side portion of the casing 8 and a stator 2 which is provided on a central portion of the interior wall of the casing 8 and has a plurality of grooves.

[0063] The rotor 1 is positioned at an approximate central part of the casing 8. A crushing area 6 for crushing the kneaded first component (the kneaded material) is defined by a space between the rotor 1 and the stator 2.

[0064] The rotor 1 is configured to be capable of being rotated by driving of the motor 5. The kneaded first component (the kneaded material) is supplied into the crushing area 6 during the rotor 1 being rotated. Then, the kneaded

material and the second powder material which are measured just after the first powder material and the second powder material have been prepared.

[0074] (Mixing process)

In the mixing process, the first powder material, which is prepared by pulverizing the first component containing the epoxy resin, the curing agent and the inorganic filler after the first component has been heat-melted and kneaded; and the second powder material, which is prepared by pulverizing the second component containing the curing accelerator; are dispersed and mixed with each other. The mixing process can be carried out by using a mixer selected from the group comprising a rotating type mixer such as a blade rotating type mixer, a ball mill or a ribbon blender; and a dispersed movement type mixer such as a V-type mixer, a rocking mill. These mixers can uniformly disperse and mix the first powder material and the second powder material with each other.

[0075] Further, the second powder material may be added and mixed with the first powder material at the time of preparing the first powder material by pulverizing the first component after the first component is heat-melted and kneaded (namely, at the pulverizing process for preparing the first powder material). This makes it possible to improve uniform dispersibility of the first powder material and the second powder material. In this case, both of the pulverizing process for preparing the first powder material and the mixing process for mixing the first powder material and the second powder material can be carried out in one process. As a result, it is possible to improve efficiency of overall process.

[0076] In order to carry out both of the pulverizing process for preparing the first powder material and the mixing process in one process, it is necessary to use a pulverizing machine having functions of pulverizing, dispersing and mixing. Examples of such pulverizing machine include a ball mill such as a jet mill, a vibrating ball mill, a continuous rotating ball mill or a batch type ball mill; a pot mill such as a pulverizer, a hammer mill or a planet pot mill; a roller mill or the like. Among these pulverizing machines, each of the jet mill, the ball mill, the hammer mill and the pat mill is preferably used, and the jet mill is more preferably used. This makes it possible to pulverize the kneaded first

component (the kneaded material containing the heat-melted and kneaded epoxy resin, the heat-melted and kneaded curing agent and the inorganic filler) while uniformly dispersing and mixing the first powder material and the curing accelerator.

[0077] According to this method, the resin composition in which the first powder material and the second powder material are mixed with each other can be prepared. In the resin composition, the first powder material and the second powder material are dispersed in a state that the second powder material uniformly adheres to a surface of the first powder material.

[0078] Therefore, it is possible to prevent the curing accelerator contained in the second powder material from contacting with the epoxy resin and the curing agent contained in the first powder material at areas except areas where the second powder material already adheres to the surface of the first powder material. This makes it possible to reliably suppress a reaction progress between the epoxy resin and the curing agent which is caused by existence of the curing accelerator (catalyst). As a result, it is possible to store the resin composition (a mixture of the first powder material and the second powder material) at room temperature.

[0079] In a general mixing process for mixing powder materials, a temperature of the powder material to be mixed rises due to heat generated by collision (crushing) between powder materials. Therefore, in the present invention, it is preferred that a mixer in which heat is not likely to be generated by, for example, collision between the powder materials (the first powder material and the second powder material) is used and a temperature adjustment is carried out so as not to allow the temperatures of the powder materials to be heated at a temperature equal to or higher than the melting temperatures or the softening temperatures of the epoxy resin, the curing agent and the curing accelerator. This makes it possible to produce a resin tablet (compact) for encapsulation having superior long term storage stability at room temperature, good moldability (particularly, fluidity) and good curable property, regardless of the kind of the curing accelerator. Examples of such mixer in which the heat is not likely to be generated by, for example, the collision between the powder materials include a V-type mixer and the like. A method for adjusting the temperatures of the powder materials is not particularly limited to a specific method. Examples of

a patent document (JP 2006-187873A) discloses a molding process for molding a mixed powder material into a tablet shape. In generally, a melting and kneading process for melting and kneading the mixed powder material is carried out. However, in the molding process of the above patent document, the melting and kneading process is not substantively carried out in order to prevent foreign substance from being mixed into a resin tablet (compact) for semiconductor encapsulation. In the process of the above patent document, it is necessary to heat the mixed powder material to a temperature of about 80 to 130°C for obtaining predetermined fluidity and then mold the mixed powder material thus heated into the tablet shape. In contrast, in order to prevent deterioration of long term storage stability at room temperature, such heating process is not carried out during the resin composition being molded in the present invention. Since the method of the present invention includes the pulverizing process for pulverizing the curing accelerator, even in a case where the prepared resin composition is molded into the tablet shape without heating, it is possible to keep sufficient fluidity of the obtained resin compact.

[0083] Even in a case where the heating process is not actively carried out, if the molding process is continuously carried out, a temperature of the resin tablet (compact) rises due to heat generated by, for example, sliding of the powder materials. Therefore, in the present invention, it is preferred that a temperature adjustment is carried out in order to prevent the temperature of the resin tablet (compact) from rising to a temperature equal to or higher than melting temperatures or softening temperatures of the epoxy resin, the curing agent or the curing accelerator. This makes it possible to obtain the resin table (compact) for encapsulation having superior long term storage stability at room temperature, good moldability (more particularly, fluidity) and curable property, regardless of the kind of the curing accelerator. A method for adjusting the temperature of the resin tablet (compact) is not particularly limited to a specific method. Examples of the method include an indirect method composed of cooling a container (housing) of a mold tool with cooling medium (for example, coolant or cool air). In a case where the molding process for molding the resin composition containing the epoxy resin, the curing agent, the curing accelerator and the inorganic filler into the tablet shape is continuously carried out for one hour without adjusting the temperature of the resin tablet (compact), the

temperature of the resin table during the resin composition being molded are shown in the table 1.

[0112] Example 2

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 3 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C and then pulverizing the heated mixture by using a pulverizer. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 3 to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0113] Example 3

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 4 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C and then pulverizing the heated mixture by using a pulverizer. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 4 to the prepared first powder material and dispersing and mixing for five minutes by using a V blender (V type mixer). Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a

pressure is 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0014] Example 4

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 3 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then pulverizing the cooled mixture by using a jet mill (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 3 to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure is 2 MPa. The obtained resin tablet has a compression degree of 88%, a diameter of 18 mm, a height of 32.5 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0115] Example 5

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 6 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then pulverizing the cooled mixture by using a jet mill (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount

of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 6 to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure is 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0116] Example 6

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 7 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then pulverizing the cooled mixture by using a jet mill (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 7 to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0117] Example 7

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 2 at room temperature by using a blade

rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then pulverizing the cooled mixture by using a pulverizer. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 2 to the prepared first powder material and dispersing and mixing for five minutes by using a V blender (V type mixer). Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0118] Example 8

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 5 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then pulverizing the cooled mixture by using a jet mill (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 5 to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure is 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum

temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0119] Example 9

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 2 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was prepared by pulverizing the kneaded material by using a KRYPTON Zepros (KCM-50 made by Earthtechnica Corporation). Since the KRYPTON Zepros has more efficiently pulverizing processing ability than the jet mill and the pulverizer, and a temperature of pulverized material pulverized by using the KRYPTON Zepros does not rise, the KRYPTON Zepros is more preferable. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0120] Then, a resin raw material powder (resin composition) was prepared by adding the curing accelerator 2 used as the second powder material to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer.

[0121] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 91%, a diameter of 18 mm, a height of 31.6 mm and a weight of 14.5 g.

[0122] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0123] Example 10

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 2 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a

heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was prepared by pulverizing the kneaded material by using a wing mill (WM-30 made by Sansho industry Corporation). Since the wing mill has more efficiently than the KRYPTON Zepros and the pulverizer and a temperature of pulverized material pulverized by using the wing mill does not rise, the wing mill is more preferable. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0124] Then, a resin raw material powder (resin composition) was prepared by adding the curing accelerator 2 used as the second powder material to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer.

[0125] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 91%, a diameter of 18 mm, a height of 31.6 mm and a weight of 14.5 g.

[0126] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0127] Example 11

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 8 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was prepared by pulverizing the kneaded material by using a pulverizer. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0128] Then, a resin composition was prepared by adding the curing accelerator 8 used as the second powder material to the prepared first powder material and dispersing and mixing for five minutes by using a V blender (V type mixer).

[0129] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g.

[0130] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0131] Example 12

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 2 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was prepared by pulverizing the kneaded material by using a jet mill (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0132] Then, a resin composition was prepared by adding the curing accelerator 2 used as the second powder material to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer.

[0133] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g.

[0134] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0135] Example 13

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 9 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was prepared by pulverizing the kneaded material by using a pulverizer (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0136] Then, a resin composition was prepared by adding the curing accelerator 9 used as the second powder material to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer.

[0137] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g.

[0138] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0139] Example 14

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 10 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was

prepared by pulverizing the kneaded material by using a pulverizer (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0140] Then, a resin composition was prepared by adding the curing accelerator 10 used as the second powder material to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer.

[0141] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g.

[0142] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0143] Example 15

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 11 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was prepared by pulverizing the kneaded material by using a pulverizer (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0144] Then, a resin composition was prepared by adding the curing accelerator 11 used as the second powder material

to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer.

[0145] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g.

[0146] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 1.

[0147] Comparative example 1

A first powder material was prepared by mixing each component described in the following table 2 other than the curing accelerator 1 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then pulverizing the cooled mixture by using a pulverizer. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 2. Then, a resin composition was prepared by adding the curing accelerator 1 to the prepared first powder material and dispersing and mixing by using a blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 91%, a diameter of 18 mm, a height of 31.6 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 2.

[0148] Comparative example 2

A first powder material was prepared by mixing each component described in the following table 2 other than the curing accelerator 3 at room temperature by using a blade

rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then roughly pulverizing the cooled mixture. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 2. Then, a resin composition was prepared by adding the curing accelerator 3 to the prepared first powder material and dispersing and mixing by using a blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 91%, a diameter of 18 mm, a height of 31.6 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 2.

[0149] Comparative example 3

A resin composition was prepared by mixing each component described in the following table 2 and the curing accelerator 1 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then roughly pulverizing the cooled mixture. A median diameter of the prepared resin composition was 720 μm and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared resin composition was 70 wt%. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 91%, a diameter of 18 mm, a height of 31.6 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 2.

[0150] Comparative example 4

A resin composition was prepared by mixing each component described in the following table 2 and the curing

accelerator 3 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then roughly pulverizing the cooled mixture. A median diameter of the prepared resin composition was 750 μm and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared resin composition was 70 wt%. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 91%, a diameter of 18 mm, a height of 31.6 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin table during molding the resin composition being molded are shown in the table 2.

[0151] The obtained resin tablets (examples 1 to 15 and comparative examples 1 to 4) were evaluated in the following method. The evaluation results are shown in the tables 1 and 2.

Evaluation method

Fluidity (viscosity of the resin compact measured by a Koka-type flow tester): The fluidity was measured by a Koka-type flow tester (constant-load orifice-type flow tester, CFT-500 made by Shimadzu Corporation) under conditions that a temperature was 175°C, a pressure was 10 kgf/cm^2, a capillary diameter was 0.5 mm. A unit of the fluidity is Pa·s. The fluidities of the resin tablets were evaluated based on the following evaluation criteria.

A: The resin tablet having fluidity of equal to or lower than 20 Pa·s is evaluated as "A".

B: The resin tablet having fluidity of higher than 20 Pa·s is evaluated as "B".

[0152] Long term storage stability at a temperature of 30°C: The long term storage stability was defined by an increasing rate of viscosity of the resin tablet. The increasing rate of the viscosity is expressed in percentage, which is calculated from a first viscosity (an initial viscosity) of the resin tablet measured before the resin tablet was stored and a second fluidity of the resin tablet measure after the resin tablet was stored for thirty days under conditions that a temperature is 30°C and a relative

[0155] Table 1

Table 1

			Examples														
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Composition ratio of resin raw material powder (parts by weight)	Epoxy resin 1		78	78	78	78	78	78	78	78	78	78	78	78	70	78	78
	Curing agent 1		52	52	52	52	52	52	52	52	52	52	52	52	52	47	47
	Curing accelerator 1																
	Curing accelerator 2		3						3		3	3		3			
	Curing accelerator 3			3		3											
	Curing accelerator 4				3												
	Curing accelerator 5									3							
	Curing accelerator 6						3.1										
	Curing accelerator 7							7.25									
	Curing accelerator 8												3				
	Curing accelerator 9														11		
	Curing accelerator 10															8	
	Curing accelerator 11																58
	Inorganic filler 1		850	850	850	850	850	845.75	850	850	850	850	850	850	850	850	800
	Silane coupling agent 1		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Coloring agent 1		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Release agent 1		1	1	1	1	0.9	1	1	1	1	1	1	1	1	1	1
Method for pulverizing second powder material and particle size of curing accelerator	Added in pulverizing process	Silica						○									○
		Releasing agent					○										
		Epoxy resin													○		
		Curing agent														○	○
		No addition	○	○	○	○			○	○	○	○	○	○			
	Pulverization Method	Jet mill pulverization (Condition 1)	○				○	○	○	○	○	○		○	○	○	○
		Jet mill pulverization (Condition 2)		○		○											
		Pot mill pulverization			○								○				
		No Finely pulverization															
	Speed of supplying raw materials (kg/h)		3	1	-	1	3	3	3	3	3	3	-	3	3	3	3
	Maximum temperature of the resin compositon during pulverization (°C)		28	31	26	31	28	29	28	28	28	28	26	28	28	28	28
	Particle size	Median diameter (μm)	3	2	15	2	4	3	3	3	3	3	22	3	6	5	3
		a ratio of an amount of large-sized particles having a diameter equal to or larger than 50 μm (wt%)	5	2	8	2	6	5	5	5	5	5	9	5	7	6	5
Method for finely pulverizing heated and kneaded material of first powder material and particle size thereof	Finely pulverization method	KRYPTON Zepros pulverization									○						
		Wing mill pulverization										○					
		Jet mill pulverization				○	○	○		○				○			
		Pulverizer pulverization	○	○	○				○				○		○	○	○
		No finely pulverization (rough pulverization)															
	Speed of supplying raw materials (kg/h)		3	3	1	3	3	3	3	3	30	30	3	10	3	3	3
	Maximum temperature of compositon during rough pulverization (°C)		34	34	34	32	32	32	34	33	10	22	34	30	34	34	34
	Particle size	Median diameter (μm)	171	158	170	132	140	123	171	125	185	110	170	230	165	159	153
		a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm (wt%)	5	5	5	2	2	2	5	2	5	1	5	9	5	5	6
Method for producing resin composition	Addition of accelerator	Curing agent is added to heated and kneaded material	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Curing agent is heated and kneaded at the same time															
	Dispersion and mixing	Dispersion and mixing are carried out with blade rotating type mixer	○	○	○	○	○	○		○	○	○	○	○	○	○	○
		Dispersion and mixing are carried out with V type mixer							○								
	Maximum temperature of compositon during dispersion and mixing (°C)		28	28	28	28	28	28	29	29	28	28	28	28	28	28	28
Maximum temperature of tablet during molding (°C)			26	27	26	27	26	26	27	27	26	26	26	26	26	26	26
Evaluation results	Fluidity (viscosity measured by a Koka-type flow tester)	Viscosity (Pa·s)	11	12	12	10	10	11	11	10	11	11	12	11	11	11	11
		Results	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Long term storage stability at a temperature of 30°C (30°C, 50 RH%, 30 days strage)	Viscosity (Pa·s)	11	12	12	9	9	12	11	10	11	11	12	10	10	10	10
		Increasing rate of viscosity (%)	0	0	0	-10	-10	9	0	0	0	0	0	0	0	0	0
		Results	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Curable property	Gel-time at 175°C (second)	42	36	59	38	40	45	42	43	44	36	59	58	44	41	43
		Results	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Appearance		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

[0156] Table 2

Table 2

				Comparative Examples			
				1	2	3	4
Composition ratio of resin composition (parts by weight)	Epoxy resin 1			78	78	78	78
	Curing agent 1			52	52	52	52
	Curinge accelerator 1			3		3	
	Curinge accelerator 2						
	Curinge accelerator 3				3		3
	Curinge accelerator 4						
	Curinge accelerator 5						
	Curinge accelerator 6						
	Curinge accelerator 7						
	Curinge accelerator 8			850	850	850	850
	Silane coupling agent 1			3	3	3	3
	Coloring agent 1			3	3	3	3
	Release agent 1			1	1	1	1
Method for pulverizing second powder material and particle size of curing accelerator	Added in pulverizing process	Silica					
		Release agent					
		No addition			○		○
	Pulverization Method	Jet mill pulverization (Condition 1)			○		○
		Jet mill pulverization (Condition 2)					
		Pot mill pulverization					
		No Finely pulverization		○		○	
	Speed of supplying raw materials (kg/h)			-	3	-	3
	Maximum temperature of the resin compositon during pulverization (°C)			-	28	-	28
	Particle size	Median diameter (μm)		100	3	100	3
		a ratio of an amount of large-sized particles having a diameter equal to or larger than 50 μm (wt%)		80	5	80	5
Method for finely pulverizing heated and kneaded material of first powder material and particle size thereof	Finely pulverization methodn	KRYPTON Zepros pulverization					
		Wing mill pulverization					
		Jet mill pulverization					
		Pulverizer pulverization		○			
		No finely pulverization (rough pulverization)			○		
	Speed of supplying raw materials (kg/h)			5	-	-	-
	Maximum temperature of compositon during rough pulverization (°C)			34	-	-	-
	Particle size	Median diameter (μm)		182	750		
		a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm (wt%)		5	70		
Method for producing resin composition	Addition of accelerator	Curing agent is added to heated and kneaded material		○	○		
		Curing agent is heated and kneaded at the same time				○	○
	Dispersion and mixing	Dispersion and mixing are carried out with blade rotating type mixer		○	○		
		Dispersion and mixing are carried ont with V type mixer					
	Maximum temperature of compositon during dispersion and mixing (°C)			28	28	28	28
Maximum temperature of tablet during molding (°C)				27	26	27	27
Evaluation results	Fluidity (viscosity measured by a Koka-type flow tester)		Viscosity (Pa·s)	10	11	13	13
			Results	A	A	A	A
	Long term storage stability at a temperature of 30°C (30°C, 50 RH%, 30 days strage)		Viscosity (Pa·s)	10	11	18	26
			Increasing rate of viscosity (%)	0	0	38	100
			Results	A	A	B	B
	Curable property		Gel-time at 175°C (second)	270	45	48	32
			Results	B	A	A	A
	Appearance			B	B	A	A

What is claimed is:

1. A method for producing a resin compact containing an epoxy resin, a curing agent, a curing accelerator and an inorganic filler, the method comprising:

a kneading and crushing process for preparing a first powder material obtained by mixing, heat-melting, kneading and crushing a first component containing the epoxy resin and the curing agent and the inorganic filler, but not containing the curing accelerator;

a pulverizing process for preparing a second powder material obtained by pulverizing a second component containing the curing accelerator;

a mixing process for preparing a resin composition by dispersing and mixing the first powder material and the second powder material; and

a molding process for obtaining the resin compact by compression-molding the resin composition.

2. The method as claimed in claim 1, wherein temperatures of the first powder material and the second powder material are lower than melting temperatures or softening temperatures of the epoxy resin, the curing agent and the curing accelerator during the mixing process, and

wherein a temperature of the resin composition is lower than the melting temperatures or the softening temperatures of the epoxy resin, the curing agent and the curing accelerator during the molding process.

3 The method as claimed in claim 1 or 2, wherein the resin compact is a resin tablet for encapsulation.

4 The method as claimed in any one of claims 1 to 3, wherein the curing accelerator contained in the second powder material is comprised of particles having a median diameter of equal to or smaller than 20 μm,

wherein the particles of the curing accelerator include large-sized particles having a diameter of equal to or larger than 50 μm, and

wherein a ratio of an amount of the large-sized particles with respect to a total amount of the particles of the curing accelerator is equal to or less than 10%.

5. The method claimed in any one of claims 1 to 4, wherein the kneading and crushing process is carried out by

using at least one selected from the group comprising a KRYPTON Zepros, a Wing mill and a Mighty mill.

6. The method claimed in any one of claims 1 to 5, wherein the pulverizing process is carried out by using at least one selected from the group comprising a jet mill, a boll mill, a hammer mill and a pot mill.

7 The method claimed in any one of claims 1 to 6, wherein the resin composition further contains a release agent, and

wherein the second powder material further contains a part of the release agent in addition to the curing accelerator.

8. The method claimed in any one of claims 1 to 7, wherein the second component further contains a part of the inorganic filler in addition to the curing accelerator.

9. The method claimed in any one of claims 1 to 8, wherein the second component further contains a part of epoxy resin and/or a part of the curing agent in addition to the curing accelerator.

10. The method claimed in any one of claim 1 to 9, wherein the first powder material has a median diameter of equal to or smaller than 200 μm.

11. The method claimed in any one of claims 1 to 10, wherein the mixing process is carried out by using at least one selected from the group comprising a rotating type mixer and a dispersed movement type mixer.

12. The method claimed in any one of claims 1 to 11, wherein the curing accelerator contains at least one selected from the group comprising a tetra-substituted phosphonium compound, a phosphobetaine compound, an adduct of a phosphine compound and a quinone compound and an adduct of a phosphonium compound and a silane compound.

13. A resin compact obtained by the method claimed in any one of claims 1 to 11,

wherein an increasing rate of viscosity of the resin compact measured by a Koka-type flow tester (constant-load orifice-type flow tester) is equal to or less than 20%

after the resin compact is stored for thirty days under conditions that a temperature is 30°C and a relative humidity is 50 %RH.

14. A method for producing a resin composition containing an epoxy resin, a curing agent, a curing accelerator and an inorganic filler, the method comprising:

a kneading and crushing process for preparing a first powder material obtained by mixing, heat-melting, kneading and crushing a first component containing the epoxy resin and the curing agent and the inorganic filler, but not containing the curing accelerator;

a pulverizing process for preparing a second powder material obtained by pulverizing a second component containing the curing accelerator; and

a mixing process for obtaining the resin composition by dispersing and mixing the first powder material and the second powder material.

15. A resin composition obtained by the method claimed in claim 14,

wherein an increasing rate of viscosity of the resin composition measured by a Koka-type flow tester (constant-load orifice-type flow tester) is equal to or less than 20% after the resin compact is stored for thirty days under conditions that a temperature is 30°C and a relative humidity is 50 %RH.

16. An electronic component device comprising:

a semiconductor element encapsulated with the resin compact claimed in claim 13 or the resin composition claimed in claim 15 without molding.

is the group obtained by releasing protons from the proton-donating group and is bonded to the silicon atom contained in the same molecular to form the chelate structure. Similarly, each of "Y4" and "Y5" is the group obtained by releasing protons from the proton-donating group and is bonded to the silicon atom contained in the same molecular to form the chelate structure. Each of "X2" and "X3" is the same or different from each other. Each of "Y2", "Y3", "Y4" and "Y5" is the same or different from each other. A group represented by –Y2-X2-Y3- or –Y4-X3-Y5- in the general formula (4) is composed of a group obtained by releasing two protons from a proton-donor. As the proton-donor, it is preferable that, for example, an organic acid containing two or more carboxyl groups and/or hydroxyl groups, more preferable that an aromatic compound containing an aromatic ring and two or more carboxyl groups or hydroxyl groups each bonded to carbon atoms constituting the aromatic ring, and even more preferable that an aromatic compound containing an aromatic ring and two or more hydroxyl groups bonded to adjacent carbon atoms constituting the aromatic ring.

[0044] Concrete examples of such an aromatic compound include catechol, pyrogallol, 1,2-dihydroxynaphthalene, 2,3-dihydroxynaphthalene, 2,2'-biphenol, 1-1'-bi-2-naphthol, salicylic acid, 1-hydroxy-2-naphthoic acid, 3-hydroxy-naphthoic acid, chloranilic acid, tannic acid, 2-hydroxybenzylalchol, 1,2-cyclohexanediol, 1,2-propanediol, glycerin and the like. Among these aromatic compounds, the catechol, the 1,2-dihydroxynaphthalene or 2,3-dihydroxynaphthalene is preferably used.

[0045] Further, "Z1" in the general formula (4) is an organic group having an aromatic ring or a heterocyclic ring, or an aliphatic group. Concrete examples of such an organic group include an aliphatic hydrocarbon group such as a methyl group, an ethyl group, a propyl group, a butyl group, a hexyl group or an octyl group; an aromatic hydrocarbon group such as a phenyl group, a benzyl group, a naphthyl group or a biphenyl group; a reactive substituent group such as a glycidyl oxypropyl group, a mercaptopropyl group, an aminopropyl group or a vinyl group; and the like. Among these organic groups, the methyl group, the ethyl group, the phenyl group, the naphthyl group or the biphenyl group is preferably used. This is because these groups can improve thermal stability of the adduct represented by the general formula (4).

strength degradation of the cured resin composition for encapsulation. An upper limit of the amount of the inorganic filler contained in the resin composition constituting the resin compact of the present invention with respect to the total amount of the resin composition is preferably equal to or less than 93 wt%, more preferably equal to or less than 91 wt%, and even more preferably equal to or less than 90 wt%. By setting the amount of the inorganic filler to be equal to or less than the above upper limit, it is possible to allow the produced resin composition to have superior fluidity and moldability. In a case of using an inorganic flame retardant such as an aluminum hydroxide or a magnesium hydroxide; a boric acid zinc; or a molybdenum acid zinc, it is preferable to set a total amount of the inorganic flame retardant and the inorganic filler within the above range.

[0049] The resin composition constituting the resin compact of the present invention contains the epoxy resin, the curing agent, the curing accelerator and the inorganic filler. If necessary, the resin composition may contain a flame retardant such as a brominated epoxy resin, antimony oxide, phosphoric acid ester, phosphazene, aluminum hydroxide or magnesium hydroxide; an ion scavenger such as hydrotalcite; a coloring agent such as carbon black, colcothar or titanium oxide; a natural wax such as carnauba wax; a synthesized wax such as polyethylene wax; a release agent such as a higher fatty acid or metallic salt thereof (e.g., stearic acid, zinc stearate or the like) or paraffin; a stress reducer such as silicone oil or silicone rubber; a silane coupling agent; or the like.

[0050] Next, description will be given to the method for producing the resin compact of the present invention by explaining an example method for producing a resin tablet (compact) for encapsulation.

[0051] (Kneading and mixing process)

This process is a process for preparing a first powder material obtained by mixing, heat-melting, kneading and crushing a first component containing the epoxy resin, the curing agent and the inorganic filler, but not containing the curing accelerator.

[0052] The first component is composed of all materials contained in the resin compact other than the curing accelerator. The mixing, heat-melting and kneading

or higher than melting temperatures or softening temperatures of the epoxy resin and the curing agent.

[0059] Among these machines, it is preferred that the jet mill, the ball mill or the pot mill is used for pulverizing the second component, and more preferred that the jet mill is used for pulverizing the second component. This makes it possible to effectively pulverize the curing accelerator and easily set a particle size of the second powder material to fall within the above range. Further, it is possible to prepare the second powder material so as not to allow the second powder material (the second component) to be heated at a temperature equal to or higher than melting temperature or softening temperature of the curing accelerator.

[0060] Each of the Wing mill (made by Sansho industry Corporation) and the Mighty mill (made by Sansho industry Corporation) is a pulverizing machine used for preparing the first powder material which can finely pulverize the kneaded first component (the kneaded material) by crushing the kneaded material against a plurality of blades for pulverization.

[0061] The KRYPTON Zepros (made by Earthtechnica Corporation) is a pulverizing machine used for preparing the first powder material which can finely pulverize the kneaded first component (the kneaded material) between a rotor and a liner with shearing force and frictional force. As shown in FIG. 2, the KRYPTON Zepros includes a casing 8, a rotor 1 having a plurality of grooves, a motor 5 for rotating the rotor 1.

[0062] The casing 8 has an interior wall, an inlet 3 provided at a lower side portion of the casing 8, an outlet 4 provided at an upper side portion of the casing 8 and a stator 2 which is provided on a central portion of the interior wall of the casing 8 and has a plurality of grooves.

[0063] The rotor 1 is positioned at an approximate central part of the casing 8. A crushing area 6 for crushing the kneaded first component (the kneaded material) is defined by a space between the rotor 1 and the stator 2.

[0064] The rotor 1 is configured to be capable of being rotated by driving of the motor 5. The kneaded first component (the kneaded material) is supplied into the crushing area 6 during the rotor 1 being rotated. Then, the kneaded

material and the second powder material which are measured just after the first powder material and the second powder material have been prepared.

[0074] (Mixing process)

In the mixing process, the first powder material, which is prepared by pulverizing the first component containing the epoxy resin, the curing agent and the inorganic filler after the first component has been heat-melted and kneaded; and the second powder material, which is prepared by pulverizing the second component containing the curing accelerator; are dispersed and mixed with each other. The mixing process can be carried out by using a mixer selected from the group comprising a rotating type mixer such as a blade rotating type mixer, a ball mill or a ribbon blender; and a dispersed movement type mixer such as a V-type mixer, a rocking mill. These mixers can uniformly disperse and mix the first powder material and the second powder material with each other.

[0075] Further, the second powder material may be added and mixed with the first powder material at the time of preparing the first powder material by pulverizing the first component after the first component is heat-melted and kneaded (namely, at the pulverizing process for preparing the first powder material). This makes it possible to improve uniform dispersibility of the first powder material and the second powder material. In this case, both of the pulverizing process for preparing the first powder material and the mixing process for mixing the first powder material and the second powder material can be carried out in one process. As a result, it is possible to improve efficiency of overall process.

[0076] In order to carry out both of the pulverizing process for preparing the first powder material and the mixing process in one process, it is necessary to use a pulverizing machine having functions of pulverizing, dispersing and mixing. Examples of such pulverizing machine include a ball mill such as a jet mill, a vibrating ball mill, a continuous rotating ball mill or a batch type ball mill; a pot mill such as a pulverizer, a hammer mill or a planet pot mill; a roller mill or the like. Among these pulverizing machines, each of the jet mill, the ball mill, the hammer mill and the pot mill is preferably used, and the jet mill is more preferably used. This makes it possible to pulverize the kneaded first

component (the kneaded material containing the heat-melted and kneaded epoxy resin, the heat-melted and kneaded curing agent and the inorganic filler) while uniformly dispersing and mixing the first powder material and the curing accelerator.

[0077] According to this method, the resin composition in which the first powder material and the second powder material are mixed with each other can be prepared. In the resin composition, the first powder material and the second powder material are dispersed in a state that the second powder material uniformly adheres to a surface of the first powder material.

[0078] Therefore, it is possible to prevent the curing accelerator contained in the second powder material from contacting with the epoxy resin and the curing agent contained in the first powder material at areas except areas where the second powder material already adheres to the surface of the first powder material. This makes it possible to reliably suppress a reaction progress between the epoxy resin and the curing agent which is caused by existence of the curing accelerator (catalyst). As a result, it is possible to store the resin composition (a mixture of the first powder material and the second powder material) at room temperature.

[0079] In a general mixing process for mixing powder materials, a temperature of the powder material to be mixed rises due to heat generated by collision (crushing) between powder materials. Therefore, in the present invention, it is preferred that a mixer in which heat is not likely to be generated by, for example, collision between the powder materials (the first powder material and the second powder material) is used and a temperature adjustment is carried out so as not to allow the powder materials to be heated at a temperature equal to or higher than the melting temperatures or the softening temperatures of the epoxy resin, the curing agent and the curing accelerator. This makes it possible to produce a resin tablet (compact) for encapsulation having superior long term storage stability at room temperature, good moldability (particularly, fluidity) and good curable property, regardless of the kind of the curing accelerator. Examples of such mixer in which the heat is not likely to be generated by, for example, the collision between the powder materials include a V-type mixer and the like. A method for adjusting the temperatures of the powder materials is not particularly limited to a specific method. Examples of

a patent document (JP 2006-187873A) discloses a molding process for molding a mixed powder material into a tablet shape. In generally, a melting and kneading process for melting and kneading the mixed powder material is carried out. However, in the molding process of the above patent document, the melting and kneading process is not substantively carried out in order to prevent foreign substance from being mixed into a resin tablet (compact) for semiconductor encapsulation. In the process of the above patent document, it is necessary to heat the mixed powder material to a temperature of about 80 to 130°C for obtaining predetermined fluidity and then mold the mixed powder material thus heated into the tablet shape. In contrast, in order to prevent deterioration of long term storage stability at room temperature, such heating process is not carried out during the resin composition being molded in the present invention. Since the method of the present invention includes the pulverizing process for pulverizing the curing accelerator, even in a case where the prepared resin composition is molded into the tablet shape without heating, it is possible to keep sufficient fluidity of the obtained resin compact.

[0083] Even in a case where the heating process is not actively carried out, if the molding process is continuously carried out, a temperature of the resin tablet (compact) rises due to heat generated by, for example, sliding of the powder materials. Therefore, in the present invention, it is preferred that a temperature adjustment is carried out in order to prevent the temperature of the resin tablet (compact) from rising to a temperature equal to or higher than melting temperatures or softening temperatures of the epoxy resin, the curing agent or the curing accelerator. This makes it possible to obtain the resin tablet (compact) for encapsulation having superior long term storage stability at room temperature, good moldability (more particularly, fluidity) and curable property, regardless of the kind of the curing accelerator. A method for adjusting the temperature of the resin tablet (compact) is not particularly limited to a specific method. Examples of the method include an indirect method composed of cooling a container (housing) of a mold tool with cooling medium (for example, coolant or cool air). In a case where the molding process for molding the resin composition containing the epoxy resin, the curing agent, the curing accelerator and the inorganic filler into the tablet shape is continuously carried out for one hour without adjusting the temperature of the resin tablet (compact), the

temperature of the resin tablet during the resin composition being molded are shown in the table 1.

[0112] Example 2

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 3 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C and then pulverizing the heated mixture by using a pulverizer. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 3 to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0113] Example 3

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 4 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C and then pulverizing the heated mixture by using a pulverizer. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 4 to the prepared first powder material and dispersing and mixing for five minutes by using a V blender (V type mixer). Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a

pressure is 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0114] Example 4

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 3 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then pulverizing the cooled mixture by using a jet mill (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 3 to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure is 2 MPa. The obtained resin tablet has a compression degree of 88%, a diameter of 18 mm, a height of 32.5 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0115] Example 5

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 6 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then pulverizing the cooled mixture by using a jet mill (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount

of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 6 to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure is 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0116] Example 6

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 7 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then pulverizing the cooled mixture by using a jet mill (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 7 to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0117] Example 7

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 2 at room temperature by using a blade

rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then pulverizing the cooled mixture by using a pulverizer. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 2 to the prepared first powder material and dispersing and mixing for five minutes by using a V blender (V type mixer). Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0118] Example 8

A first powder material was prepared by mixing each component described in the following table 1 other than the curing accelerator 5 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then pulverizing the cooled mixture by using a jet mill (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1. Then, a resin composition was prepared by adding the curing accelerator 5 to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure is 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum

temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0119] Example 9

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 2 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was prepared by pulverizing the kneaded material by using a KRYPTON Zepros (KCM-50 made by Earthtechnica Corporation). Since the KRYPTON Zepros has more efficiently pulverizing processing ability than the jet mill and the pulverizer, and a temperature of pulverized material pulverized by using the KRYPTON Zepros does not rise, the KRYPTON Zepros is more preferable. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0120] Then, a resin raw material powder (resin composition) was prepared by adding the curing accelerator 2 used as the second powder material to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer.

[0121] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 91%, a diameter of 18 mm, a height of 31.6 mm and a weight of 14.5 g.

[0122] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0123] Example 10

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 2 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a

heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was prepared by pulverizing the kneaded material by using a wing mill (WM-30 made by Sansho industry Corporation). Since the wing mill has more efficiently than the KRYPTON Zepros and the pulverizer and a temperature of pulverized material pulverized by using the wing mill does not rise, the wing mill is more preferable. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0124] Then, a resin raw material powder (resin composition) was prepared by adding the curing accelerator 2 used as the second powder material to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer.

[0125] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 91%, a diameter of 18 mm, a height of 31.6 mm and a weight of 14.5 g.

[0126] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0127] Example 11

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 8 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was prepared by pulverizing the kneaded material by using a pulverizer. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0128] Then, a resin composition was prepared by adding the curing accelerator 8 used as the second powder material to the prepared first powder material and dispersing and mixing for five minutes by using a V blender (V type mixer).

[0129] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g.

[0130] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0131] Example 12

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 2 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was prepared by pulverizing the kneaded material by using a jet mill (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0132] Then, a resin composition was prepared by adding the curing accelerator 2 used as the second powder material to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer.

[0133] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g.

[0134] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0135] Example 13

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 9 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was prepared by pulverizing the kneaded material by using a pulverizer (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0136] Then, a resin composition was prepared by adding the curing accelerator 9 used as the second powder material to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer.

[0137] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g.

[0138] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0139] Example 14

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 10 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was

prepared by pulverizing the kneaded material by using a pulverizer (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0140] Then, a resin composition was prepared by adding the curing accelerator 10 used as the second powder material to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer.

[0141] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g.

[0142] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0143] Example 15

A kneaded material was prepared by mixing each component described in the following table 1 other than the curing accelerator 11 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, and then cooling the heated mixture. Then, a first powder material was prepared by pulverizing the kneaded material by using a pulverizer (under conditions that air pressure was 0.5 MPa and speed of supplying raw materials was 3 kg/h). A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 1.

[0144] Then, a resin composition was prepared by adding the curing accelerator 11 used as the second powder material

to the prepared first powder material and dispersing and mixing for five minutes by using the blade rotating type mixer.

[0145] Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 90%, a diameter of 18 mm, a height of 31.8 mm and a weight of 14.5 g.

[0146] A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 1.

[0147] Comparative example 1

A first powder material was prepared by mixing each component described in the following table 2 other than the curing accelerator 1 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then pulverizing the cooled mixture by using a pulverizer. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 2. Then, a resin composition was prepared by adding the curing accelerator 1 to the prepared first powder material and dispersing and mixing by using a blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 91%, a diameter of 18 mm, a height of 31.6 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 2.

[0148] Comparative example 2

A first powder material was prepared by mixing each component described in the following table 2 other than the curing accelerator 3 at room temperature by using a blade

rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then roughly pulverizing the cooled mixture. A median diameter of the prepared first powder material and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared first powder material are shown in the table 2. Then, a resin composition was prepared by adding the curing accelerator 3 to the prepared first powder material and dispersing and mixing by using a blade rotating type mixer. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 91%, a diameter of 18 mm, a height of 31.6 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 2.

[0149] Comparative example 3

A resin composition was prepared by mixing each component described in the following table 2 and the curing accelerator 1 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then roughly pulverizing the cooled mixture. A median diameter of the prepared resin composition was 720 μm and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared resin composition was 70 wt%. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 91%, a diameter of 18 mm, a height of 31.6 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 2.

[0150] Comparative example 4

A resin composition was prepared by mixing each component described in the following table 2 and the curing

accelerator 3 at room temperature by using a blade rotating type mixer, melting and kneading a mixture by using a heated roller having a temperature of 80 to 100°C, cooling the heated mixture and then roughly pulverizing the cooled mixture. A median diameter of the prepared resin composition was 750 μm and a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm with respect to a total amount of particles of the prepared resin composition was 70 wt%. Then, a resin tablet was obtained by molding the prepared resin composition into a tablet shape by using the tablet making machine (S-20A made by Mitsubishi materials techno Corporation) under a condition that a pressure was 2 MPa. The obtained resin tablet has a compression degree of 91%, a diameter of 18 mm, a height of 31.6 mm and a weight of 14.5 g. A maximum temperature of the resin composition during dispersion and mixing and a maximum temperature of the resin tablet during molding the resin composition being molded are shown in the table 2.

[0151] The obtained resin tablets (examples 1 to 15 and comparative examples 1 to 4) were evaluated in the following method. The evaluation results are shown in the tables 1 and 2.

Evaluation method

Fluidity (viscosity of the resin compact measured by a Koka-type flow tester): The fluidity was measured by a Koka-type flow tester (constant-load orifice-type flow tester, CFT-500 made by Shimadzu Corporation) under conditions that a temperature was 175°C, a pressure was 10 kgf/cm^2, a capillary diameter was 0.5 mm. A unit of the fluidity is Pa·s. The fluidities of the resin tablets were evaluated based on the following evaluation criteria.

A: The resin tablet having fluidity of equal to or lower than 20 Pa·s is evaluated as “A”.

B: The resin tablet having fluidity of higher than 20 Pa·s is evaluated as “B”.

[0152] Long term storage stability at a temperature of 30°C: The long term storage stability was defined by an increasing rate of viscosity of the resin tablet. The increasing rate of the viscosity is expressed in percentage, which is calculated from a first viscosity (an initial viscosity) of the resin tablet measured before the resin tablet was stored and a second fluidity of the resin tablet measure after the resin tablet was stored for thirty days under conditions that a temperature is 30°C and a relative

[0155] Table 1

Table 1

				Examples														
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Composition ratio of resin raw material powder (parts by weight)	Epoxy resin 1			78	78	78	78	78	78	78	78	78	78	78	78	70	78	78
	Curing agent 1			52	52	52	52	52	52	52	52	52	52	52	52	52	47	47
	Curing accelerator 1																	
	Curing accelerator 2			3						3		3	3		3			
	Curing accelerator 3				3		3											
	Curing accelerator 4					3												
	Curing accelerator 5										3							
	Curing accelerator 6							3.1										
	Curing accelerator 7								7.25									
	Curing accelerator 8													3				
	Curing accelerator 9															11		
	Curing accelerator 10																8	
	Curing accelerator 11																	58
	Inorganic filler 1			850	850	850	850	850	845.75	850	850	850	850	850	850	850	850	800
	Silane coupling agent 1			3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Coloring agent 1			3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Release agent 1			1	1	1	1	0.9	1	1	1	1	1	1	1	1	1	1
Method for pulverizing second powder material and particle size of curing accelerator	Added in pulverizing process	Silica							○									○
		Releasing agent						○										
		Epoxy resin														○		
		Curing agent															○	○
		No addition		○	○	○	○			○	○	○	○	○	○			
	Pulverization Method	Jet mill pulverization (Condition 1)		○				○	○	○	○	○	○		○	○	○	○
		Jet mill pulverization (Condition 2)			○		○											
		Pot mill pulverization				○								○				
		No Finely pulverization																
	Speed of supplying raw materials (kg/h)			3	1	-	1	3	3	3	3	3	3	-	3	3	3	3
	Maximum temperature of the resin compositon during pulverization (°C)			28	31	26	31	28	29	28	28	28	28	26	28	28	28	28
	Particle size	Median diameter (μm)		3	2	15	2	4	3	3	3	3	3	22	3	6	5	3
		a ratio of an amount of large-sized particles having a diameter equal to or larger than 50 μm (wt%)		5	2	8	2	6	5	5	5	5	5	9	5	7	6	5
Method for finely pulverizing heated and kneaded material of first powder material and particle size thereof	Finely pulverization method	KRYPTON Zepros pulverization										○						
		Wing mill pulverization											○					
		Jet mill pulverization					○	○	○		○				○			
		Pulverizer pulverization		○	○	○				○				○		○	○	○
		No finely pulverization (rough pulverization)																
	Speed of supplying raw materials (kg/h)			3	3	1	3	3	3	3	3	30	30	3	10	3	3	3
	Maximum temperature of compositon during pulverization (°C)			34	34	34	32	32	32	34	33	10	22	34	30	34	34	34
	Particle size	Median diameter (μm)		171	158	170	132	140	123	171	125	185	110	170	230	165	159	153
		a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm (wt%)		5	5	5	2	2	2	5	2	5	1	5	9	5	5	6
Method for producing resin composition	Addition of accelerator	Curing agent is added to heated and kneaded material		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
		Curing agent is heated and kneaded at the same time																
	Dispersion and mixing	Dispersion and mixing are carried out with blade rotating type mixer		○	○	○	○	○	○		○	○	○	○	○	○	○	○
		Dispersion and mixing are carried out with V type mixer								○								
	Maximum temperature of compositon during dispersion and mixing (°C)			28	28	28	29	28	28	29	29	28	28	28	28	28	28	28
Maximum temperature of tablet during molding (°C)				26	27	26	27	26	26	27	27	26	26	26	26	26	26	26
Evaluation results	Fluidity (viscosity measured by a Koka-type flow tester)	Viscosity (Pa·s)		11	12	12	10	10	11	11	10	11	11	12	11	11	11	11
		Results		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Long term storage stability at a temperature of 30°C (30°C, 50 RH%, 30 days strage)	Viscosity (Pa·s)		11	12	12	9	9	12	11	10	11	11	12	10	10	10	10
		Increasing rate of viscosity (%)		0	0	0	-10	-10	9	0	0	0	0	0	0	0	0	0
		Results		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Curable property	Gel-time at 175°C (second)		42	36	59	38	40	45	42	43	44	36	59	58	44	41	43
		Results		A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Appearance			A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

[0156] Table 2

Table 2

				Comparative Examples			
				1	2	3	4
Composition ratio of resin composition (parts by weight)	Epoxy resin 1			78	78	78	78
	Curing agent 1			52	52	52	52
	Curinge accelerator 1			3		3	
	Curinge accelerator 2						
	Curinge accelerator 3				3		3
	Curinge accelerator 4						
	Curinge accelerator 5						
	Curinge accelerator 6						
	Curinge accelerator 7						
	Curinge accelerator 8			850	850	850	850
	Silane coupling agent 1			3	3	3	3
	Coloring agent 1			3	3	3	3
	Release agent 1			1	1	1	1
Method for pulverizing second powder material and particle size of curing accelerator	Added in pulverizing process	Silica					
		Release agent					
		No addition			○		○
	Pulverization Method	Jet mill pulverization (Condition 1)			○		○
		Jet mill pulverization (Condition 2)					
		Pot mill pulverization					
		No Finely pulverization		○		○	
	Speed of supplying raw materials (kg/h)			-	3	-	3
	Maximum temperature of the resin compositon during pulverization (°C)			-	28	-	28
	Particle size	Median diameter (μm)		100	3	100	3
		a ratio of an amount of large-sized particles having a diameter equal to or larger than 50 μm (wt%)		80	5	80	5
Method for finely pulverizing heated and kneaded material of first powder material and particle size thereof	Finely pulverization methodn	KRYPTON Zepros pulverization					
		Wing mill pulverization					
		Jet mill pulverization					
		Pulverizer pulverization		○			
		No finely pulverization (rough pulverization)			○		
	Speed of supplying raw materials (kg/h)			5	-	-	-
	Maximum temperature of compositon during pulverization (°C)			34	-	-	-
	Particle size	Median diameter (μm)		182	750		
		a ratio of an amount of large-sized particles having a diameter equal to or larger than 500 μm (wt%)		5	70		
Method for producing resin composition	Addition of accelerator	Curing agent is added to heated and kneaded material		○	○		
		Curing agent is heated and kneaded at the same time				○	○
	Dispersion and mixing	Dispersion and mixing are carried out with blade rotating type mixer		○	○		
		Dispersion and mixing are carried out with V type mixer					
	Maximum temperature of compositon during dispersion and mixing (°C)			28	28	28	28
Maximum temperature of tablet during molding (°C)				27	26	27	27
Evaluation results	Fluidity (viscosity measured by a Koka-type flow tester)	Viscosity (Pa·s)		10	11	13	13
		Results		A	A	A	A
	Long term storage stability at a temperature of 30°C (30°C, 50 RH%, 30 days strage)	Viscosity (Pa·s)		10	11	18	26
		Increasing rate of viscosity (%)		0	0	38	100
		Results		A	A	B	B
	Curable property	Gel-time at 175°C (second)		270	46	48	32
		Results		B	A	A	A
	Appearance			B	B	A	A

What is claimed is:

1. A method for producing a resin compact made from a resin composition containing an epoxy resin, a curing agent, a curing accelerator and an inorganic filler, the method comprising:

a kneading and crushing process for preparing a first powder material obtained by mixing, heat-melting, kneading and crushing a first component containing the epoxy resin and the curing agent and the inorganic filler, but not containing the curing accelerator;

a pulverizing process for preparing a second powder material obtained by pulverizing a second component containing the curing accelerator;

a mixing process for preparing the resin composition by dispersing and mixing the first powder material and the second powder material; and

a molding process for obtaining the resin compact by compression-molding the resin composition;

wherein the curing accelerator contained in the second powder material comprises particles having a median diameter of equal to or smaller than 20 μm and include large-sized particles having a diameter of equal to or larger than 50 μm, and

wherein a ratio of an amount of the large-sized particles with respect to a total amount of the particles of the curing accelerator is equal to or less than 10 %.

2. The method as claimed in claim 1, wherein temperatures of the first powder material and the second powder material are lower than melting temperatures or softening temperatures of the epoxy resin, the curing agent and the curing accelerator during the mixing process, and

wherein a temperature of the resin composition is lower than the melting temperatures or the softening temperatures of the epoxy resin, the curing agent and the curing accelerator during the molding process.

3 The method as claimed in claim 1, wherein the resin compact is a resin tablet for encapsulation.

4. The method claimed in claim 1, wherein the kneading and crushing process is carried out by using at least one selected from the group comprising a KRYPTON Zepros, a Wing mill and a Mighty mill.

5. The method claimed in claim 1, wherein the pulverizing process is carried out by using at least one selected from the group comprising a jet mill, a boll mill, a hammer mill and a pot mill.

6. The method claimed in claim 1, wherein the resin composition further contains a release agent, and

wherein the second powder material further contains a part of the release agent in addition to the curing accelerator.

7. The method claimed in claim 1, wherein the second component further contains a part of the inorganic filler in addition to the curing accelerator.

8. The method claimed in claim 1, wherein the second component further contains a part of epoxy resin and/or a part of the curing agent in addition to the curing accelerator.

9. The method claimed in claim 1, wherein the first powder material has a median diameter of equal to or smaller than 200 μm.

10. The method claimed in claim 1, wherein the mixing process is carried out by using at least one selected from the group comprising a rotating type mixer and a dispersed movement type mixer.

11. The method claimed in claim 1, wherein the curing accelerator contains at least one selected from the group comprising a tetra-substituted phosphonium compound, a phosphobetaine compound, an adduct of a phosphine compound and a quinone compound and an adduct of a phosphonium compound and a silane compound.

12. A resin compact obtained by the method claimed in claim 1,

wherein an increasing rate of viscosity of the resin compact measured by a Koka-type flow tester (constant-load orifice-type flow tester) is equal to or less than 20% after the resin compact is stored for thirty days under conditions that a temperature is 30°C and a relative humidity is 50 %RH.

13. A method for producing a resin composition containing an epoxy resin, a curing agent, a curing accelerator and an inorganic filler, the method comprising:

a kneading and crushing process for preparing a first powder material obtained by mixing, heat-melting, kneading and crushing a first component containing the epoxy resin and the curing agent and the inorganic filler, but not containing the curing accelerator;

a pulverizing process for preparing a second powder material obtained by pulverizing a second component containing the curing accelerator; and

a mixing process for obtaining the resin composition by dispersing and mixing the first powder material and the second powder material;

wherein the curing accelerator contained in the second powder material comprises particles having a median diameter of equal to or smaller than 20 μm, and include large-sized particles having a diameter of equal to or larger than 50 μm, and

wherein a ratio of an amount of the large-sized particles

with respect to a total amount of the particles of the curing accelerator is equal to or less than 10 %.

14. A resin composition obtained by the method claimed in claim 13,

wherein an increasing rate of viscosity of the resin composition measured by a Koka-type flow tester (constant-load orifice-type flow tester) is equal to or less than 20% after the resin compact is stored for thirty days under conditions that a temperature is 30°C and a relative humidity is 50 %RH.

15. An electronic component device comprising:

a semiconductor element encapsulated with the resin compact claimed in claim 12.

16. An electronic component device comprising:

a semiconductor element encapsulated with the resin composition claimed in claim 14 without molding.

17. The method as claimed in claim 1, wherein the first powder material comprises particles having a median diameter of equal to or smaller than 200 μm and include large-sized particles having a diameter of equal to or larger than 500 μm,

wherein a ratio of an amount of the large-sized particles with respect to a total amount of the particles of the first powder material is equal to or less than 10 wt%, and

wherein in the mixing process, particles of the second powder material adhere to surfaces of the particles of the first powder material.