molding method, compression molding method, or the like, and further heated at 80 to 200°C for 2 to 10 hours to obtain a cured product. Examples of methods for encapsulating semiconductor devices using the encapsulant include potting, dipping, transfer mold encapsulation for capacitors, transistors, diodes, light-emitting diodes, ICs, LSIs, etc., potting encapsulation used in chip on board (COB), chip on film (COF), tape automated bonding (TAB), etc. of ICs and LSIs, underfill for flip chips, and encapsulation (including reinforcement underfill) during mounting of IC packages such as quad flat package (QFP), ball grid array (BGA), and chip scale package (CSP).

[0051] In the case of applying the curable resin composition of the embodiment to printed wiring board applications, the prepreg can also be obtained by having the curable resin composition be heated and melted to reduce viscosity and then be impregnated into reinforcing fibers such as glass fiber and polyamide fiber. Specific examples thereof include glass fibers such as E glass cloth, D glass cloth, S glass cloth, Q glass cloth, spherical glass cloth, NE glass cloth, and T glass cloth, and/or organic fibers, but are not particularly limited thereto. The shape of the substrate is not particularly limited, and examples include woven fabric, non-woven fabric, roving, chopped strand mat, and the like. As weaving methods for woven fabric, plain weave, huck weave, twill weave, and the like are known, and the known methods can be appropriately selected and used according to the intended application and performance. Additionally, glass woven fabric that has been subjected to fiber opening treatment or surface treatment with a silane coupling agent or the like is preferably used. The thickness of the substrate is not particularly limited, but is preferably about 0.01 to 0.4 mm. The prepreg can also be obtained by impregnating the reinforcing fiber with the varnish and heating and drying, and copper clad laminate (CCL) can be prepared based on the prepreg. By hot press molding the obtained prepreg and CCL, a laminate using the curable resin composition of the embodiment can also be prepared. The laminate is not particularly limited as long as it includes one or more prepregs, and may have any other layers. Additionally, a sheet-like adhesive can be obtained by applying the varnish on a release film and removing the solvent under heating to achieve B-staging. This sheet-like adhesive can be used as an interlayer

insulating layer in multilayer substrates or as an adhesive sheet in the case of mounting semiconductors. The curable resin composition of the embodiment can also be suitably used for special substrate materials such as package substrates and high density interconnects (HDI).

Example

[0052] The present invention will be described more specifically below by citing synthesis examples and examples. The materials, processing contents, processing procedures, etc. shown below can be appropriately changed without departing from the spirit of the present invention. Therefore, the scope of the present invention should not be interpreted in a limited manner by the specific examples shown below. Hereinafter, unless otherwise specified, parts are parts by weight.

[0053] Various analytical methods were performed under the following conditions.

- Epoxy equivalent

  Measured by the method described in JIS K-7236, and the unit is g/eq.

- Softening point

  Measured by the method in accordance with JIS K-7234, and the unit is °C.

- Melt viscosity

  Measured by ICI melt viscosity (150°C) cone plate method, and the unit is Pa·s.

- Biomass content analysis (accelerated gravimetric analysis)

  Measured and calculated in accordance with ASTM D6866-21. The unit is %.

[0054] [Synthesis Example 1]

In a flask including a stirrer, reflux condenser, and stirring device, 254 parts by weight of phenol, 63 parts by weight of water, and 27 parts by weight of sodium hydroxide were charged, and after stirring and dissolving, the mixture was heated to 110°C, and 44 parts by weight of furfural was added dropwise over 2 hours. After reacting at 110°C for 3 hours, the temperature was raised to 145°C. During the temperature rise, water that distilled out was removed from the system. After reaching 145°C, the reaction was continued for 4 hours. Then, the mixture was cooled to 80°C, 63 parts by weight of water was charged, and 4 parts by weight of phosphoric acid