CLAIM(S)

1. A method for producing a hydrogenated petroleum resin, comprising:

measuring a near-infrared absorption spectrum of a molten resin from which a hydrogenation solvent is separated; and

controlling a process for producing hydrogenated petroleum resin pellets based on a result of the measurement.

2. The method for producing the hydrogenated petroleum resin according to claim 1, wherein

in controlling the method for producing the hydrogenated petroleum resin pellets, the result of the measurement indicates a physical property value of at least one of an aromatic content ratio and a bromine number of the molten resin, and

at least one of a temperature, a pressure, a reaction time and a hydrogen content of a hydrogenation reaction is controlled such that a difference between the physical property value of the molten resin and a physical property value of a target hydrogenated petroleum resin pellet becomes small.

3. The method for producing the hydrogenated petroleum resin according to claim 1 or 2, wherein

in controlling the method for producing the hydrogenated petroleum resin pellets, the result of the measurement indicates a softening point of the molten resin, and

at least one of a temperature and a pressure in a step for separating the hydrogenation solvent or a low-molecular-weight component is controlled such that a difference between the softening point of the molten resin and a softening point of a target hydrogenated petroleum resin pellet becomes small.

CLAIMS

1. A method for producing a hydrogenated petroleum resin, comprising:

measuring a near-infrared absorption spectrum of a molten resin from which a hydrogenation solvent is separated; and

controlling at least one of a temperature, a pressure, a reaction time and a hydrogen content of a hydrogenation reaction is controlled such that a difference between the physical property value of the molten resin and a physical property value of a target hydrogenated petroleum resin pellet becomes small, based on a physical property value of at least one of an aromatic content ratio and a bromine number of the molten resin indicated by a result of the measurement.

2. The method for producing the hydrogenated petroleum resin according to claim 1, further comprising:

based on a softening point of the molten resin indicated by the result of the measurement, controlling at least one of a temperature and a pressure in a step for separating the hydrogenation solvent or a low-molecular-weight component such that a difference between the softening point and a softening point of a target hydrogenated petroleum resin pellet becomes small.

3. A method for producing a hydrogenated petroleum resin, comprising:

measuring a near-infrared absorption spectrum of a molten resin from which a hydrogenation solvent is separated; and

based on a softening point of the molten resin indicated by the result of the measurement controlling at least one of a temperature and a pressure in a step for separating the hydrogenation solvent or a low-molecular-weight component such that a difference between the softening point of the molten resin and a softening point of a target hydrogenated petroleum resin pellet becomes small.

4. The method for producing a hydrogenated petroleum resin according to any one of claims 1 to 3, wherein

in order to manufacture the hydrogenated petroleum resin pellet,

a hydrogenated petroleum resin material is thermally polymerized using a solvent,

hydrogen is added to a copolymer obtained in the thermal polymerization under a presence of a hydrogenation catalyst and hydrogenation solvent to perform a hydrogenation reaction,

the hydrogenation solvent is separated and removed from the hydrogenation product obtained in the hydrogenation reaction to obtain a molten resin whose near-infrared absorption spectrum is measured, and

the molten resin is pelletized.

5. The method for producing a hydrogenated petroleum resin according to claim 4, wherein

in the thermal polymerization, the hydrogenated petroleum resin materials in a form of a cyclopentadiene compound and a vinyl aromatic compound are thermally polymerized.

6. The method for producing a hydrogenated petroleum resin according to claim 5, wherein

the cyclopentadiene compound is selected from the group consisting of cyclopentadiene, methylcyclopentadiene, ethylcyclopentadiene, dimmer thereof and co-dimers thereof.

7. The method for producing a hydrogenated petroleum resin according to claim 5 or 6, wherein the vinyl aromatic compound is selected from the group consisting of styrene, α-methylstyrene and vinyl toluene.

8. The method for producing a hydrogenated petroleum resin according to any one of claims 5 to 7, wherein

a mixture ratio of the cyclopentadiene compound and the vinyl aromatic compound (the cyclopentadiene compound : the vinyl aromatic compound) is in a range from 70:30 to 20:80 in a mass ratio.

9. The method for producing a hydrogenated petroleum resin according to any one of claims 4 to 8, wherein

the solvent comprises an aromatic solvent, naphthene solvent and aliphatic hydrocarbon solvent.

10. The method for producing a hydrogenated petroleum resin according to any one of claims 4 to 9, wherein

the solvent used in the thermal polymerization is recovered to be reused as the solvent for the thermal polymerization.

11. The method for producing a hydrogenated petroleum resin according to any one of claims 4 to 10, wherein

the hydrogenation solvent separated and removed from the hydrogenated product is recovered to be reused as the hydrogenation solvent used in the hydrogenation reaction.

12. The method for producing a hydrogenated petroleum resin according to any one of claims 4 to 11, wherein

the hydrogenation solvent and the low-molecular-weight component are further separated and removed from the hydrogenated product from which the hydrogenation solvent is separated and removed.

13. A production plant of hydrogenated petroleum resin pellets, comprising:

a polymerizing portion for polymerizing a hydrogenated petroleum resin material to obtain a copolymer;

a hydrogenating portion for adding hydrogen to the copolymer obtained in the polymerizing portion to hydrogenate the copolymer to obtain a hydrogenated product;

a hydrogenation solvent recovering portion for separating and removing a hydrogenation solvent from the hydrogenated product obtained in the hydrogenating portion to obtain a molten resin;

a pelletizing portion for pelletizing the molten resin obtained in the hydrogenation solvent recovering portion to obtain a hydrogenated petroleum resin pellets; and

a controller for controlling a process of an entirety of the production plant, wherein

the hydrogenation solvent recovering portion comprises a near-infrared analyzing portion for measuring a near-infrared absorption spectrum of the obtained molten resin and calculating a physical property value of at least one of an aromatic content ratio and a bromine number of the molten resin based on an analytical curve database, and

the controller controls at least one of a temperature, a pressure, a reaction time and a hydrogen content of a hydrogenation reaction based on the physical property value calculated by the near-infrared analyzing portion such that a difference between the physical property value of the molten resin and a physical property value of a target hydrogenated petroleum resin pellet becomes small.

14. A production plant of hydrogenated petroleum resin pellets, comprising:

a polymerizing portion for polymerizing a hydrogenated petroleum resin material to obtain a copolymer;

a hydrogenating portion for adding hydrogen to the copolymer obtained in the polymerizing portion to hydrogenate the copolymer to obtain a hydrogenated product;

a hydrogenation solvent recovering portion for separating and removing a hydrogenation solvent from the hydrogenated product obtained in the hydrogenating portion to obtain a molten resin;

a pelletizing portion for pelletizing the molten resin obtained in the hydrogenation solvent recovering portion to obtain a hydrogenated petroleum resin pellets; and

a controller for controlling a process of an entirety of the production plant, wherein

the hydrogenation solvent recovering portion comprises a near-infrared analyzing portion for measuring a near-infrared absorption spectrum of the obtained molten resin and calculating a softening point of the molten resin based on an analytical curve database, and

the controller controls at least one of a temperature and a pressure at which the hydrogenation solvent or the low-molecular-weight component is separated in the hydrogenation solvent recovering portion based on the softening point calculated by the near-infrared analyzing portion such that a difference between the softening point of the molten resin and the softening point of a target hydrogenated petroleum resin pellet becomes small.