CLAIMS

1. A method of treating a polyimide, comprising:

providing a polyimide to be treated; and

contacting the polyimide to be treated with a fluid to obtain a treated polyimide;

wherein the polyimide comprises a first repeat unit derived from pyromellitic dianhydride (PMDA) and a second repeat unit derived from 4,4′-oxodianiline (4,4′-ODA);

and wherein the fluid comprises a supercritical fluid, a liquid with a surface tension of 10.0 mN m^{-1} or less under the conditions of the contacting step, or a mixture thereof;

wherein the polyimide to be treated is a plurality of particles;

and wherein the plurality of polyimide particles has a particle size characterised by a volume median diameter (Dv50) of 10 to 80 μm as measured by laser diffraction in deionised water in accordance with ISO 13320:2009.

2. The method according to claim 1, wherein the fluid comprises a supercritical fluid.

3. The method according to claim 1, wherein the fluid comprises a liquid with a surface tension of 8.5 mN m^{-1} or less under the conditions of the contacting step.

4. The method according to claim 3, wherein the fluid comprises a liquid with a surface tension of 4.5 mN m^{-1} or less under the conditions of the contacting step.

5. The method according to any one of the preceding claims, wherein the fluid comprises methane, ethane, ethylene, carbon dioxide, nitrous oxide, or a mixture thereof.

6. The method according to any one of the preceding claims, wherein the polyimide to be treated is poly(PMDA-co-4,4′-ODA).

7. The method according to any one of the preceding claims, wherein the fluid comprises supercritical carbon dioxide and/or liquid carbon dioxide with a surface tension of 2.0 mN m^{-1} or less.

8. The method according to any one of the preceding claims, wherein an encapsulated filler is present within the polyimide to be treated.

9. The method according to claim 8 wherein the encapsulated filler is graphite.

10. The method according to any one of the preceding claims, wherein the treated polyimide does not comprise a encapsulated filler or comprises an encapsulated filler in an amount of 20 wt% or less relative to the weight of the polyimide, and wherein the treated polyimide has a BET specific surface area greater than 100 m^2 g^{-1};

wherein the BET specific surface area is determined according to ISO 9211:2010.

11. The method according to any one of claims 1 to 9, wherein the treated polyimide comprises an encapsulated filler in an amount of 20 wt% to 60 wt% relative to the weight of the polyimide, and wherein the treated polyimide has a BET specific surface area greater than 70 m^2 g^{-1};

wherein the BET specific surface area is determined according to ISO 9211:2010.

12. The method according to any one of the preceding claims, further comprising a step of mixing the treated polyimide with an additive to obtain a polyimide mixture.

13. The method according to any of the preceding claims further comprising forming the treated polyimide obtained in the method of any one of claims 1 to 10 or the polyimide mixture obtained in the method of claim 11 to obtain a formed polyimide product.

14. The method according to claim 13 wherein the forming is carried out by direct forming to obtain a direct formed polyimide product, or wherein the forming is carried out by hot compression moulding to obtain a hot compression moulded polyimide product, or wherein the forming is carried out by hot isostatic pressing to obtain a hot isostatically pressed polyimide

product, or wherein the forming is carried out by ram extrusion to obtain a ram extruded polyimide product.

15. A method according to claim 14 wherein the polyimide product is a direct formed polyimide product and does not comprise an encapsulated filler and has a tensile strength of 80.0 MPa or more and a specific gravity of 1.40 or less;

wherein the specific gravity of a formed polyimide product is relative to deionised water and is determined by ASTM D792-20;

and wherein the tensile strength is determined by ASTM D1708.

16. The method according to claim 14 wherein the polyimide product is a direct formed polyimide product, comprises 10 to 20 wt% of an encapsulated filler and has a tensile strength of 70.0 MPa or more and a specific gravity of 1.50 or less;

wherein the specific gravity of a formed polyimide product is relative to deionised water and is determined by ASTM D792-20;

and wherein the tensile strength is determined by ASTM D1708.

17. The method according to claim 14 wherein the polyimide product is a hot compression moulded polyimide product, a hot isostatically pressed polyimide product, or a ram extruded polyimide product, does not comprise an encapsulated filler, and has a tensile strength of 90.0 MPa or more;

wherein the tensile strength is determined by ASTM D1708.

18. A method according to claim 14 wherein the polyimide product is a hot compression moulded polyimide product, a hot isostatically pressed polyimide product, or a ram extruded polyimide product, comprises 10 to 20 wt% of an encapsulated filler and has a tensile strength of 70.0 MPa or more;

wherein the tensile strength is determined by ASTM D1708.