Claims

1. A composition for beta-nucleation of polypropylene, comprising
   (a) a particulate natural mineral solid support, comprising a compound of a IUPAC Group 2 metal, and
   (b) on the surface of the particulate mineral solid support
      (b1) a salt of a dicarboxylic acid, wherein the dicarboxylic acid has from 7 to 10 carbon atoms, and
      (b2) a dispersing and/or grinding agent.

2. The composition according to claim 1, wherein the IUPAC Group 2 metal of the particulate solid support is selected from Mg, Ca, Sr, or a mixture thereof.

3. The composition according to one of the preceding claims, wherein the compound of the IUPAC Group 2 metal is selected from calcium carbonate, magnesium carbonate, calcium-magnesium carbonate, magnesium hydroxide, or any mixture thereof.

4. The composition according to claim 3, wherein the calcium carbonate is natural ground calcium carbonate, which is preferably selected from marble, limestone, chalk, or any mixture thereof.

5. The composition according to one of the preceding claims, wherein the particulate mineral solid support comprises the compound of the IUPAC Group 2 metal in an amount of at least 50 wt%, more preferably at least 70 wt%, even more preferably at least 90 wt%.

6. The composition according to one of the preceding claims, wherein the particulate mineral solid support and/or the composition has/have a medium particle size d_{50} of from 0.5 μm to 7 μm.

7. The composition according to one of the preceding claims, wherein the particulate mineral solid support and/or the composition has/have a specific surface area of from 0.5 m^2/g to 15 m^2/g, measured using nitrogen and the BET method according to ISO 9277.

8. The composition according to one of the preceding claims, wherein the salt of the dicarboxlic acid is a IUPAC Group 2 metal salt, preferably a salt selected from a calcium salt, a magnesium salt, a strontium salt, or a mixture thereof.

9. The composition according to one of the preceding claims, wherein the dicarboxylic acid is selected from pimelic acid, suberic acid, azelaic acid, phthalic acid, isophthalic acid, terephthalic acid, or any mixture thereof.

10. The composition according to one of the preceding claims, wherein the salt of the dicarboxylic acid is present in an amount of 0.05 wt% to 10 wt%, based on the weight of the particulate mineral solid support.

11. The composition according to one of the preceding claims, wherein the dispersing and/or grinding agent is selected from a homo- or copolymer of a carboxylic acid salt, glycols, polyglycols, polyalkylene glycols, sugars, alkanolamines, or mixtures thereof.

12. The composition according to one of the preceding claims, wherein the dispersing and/or grinding agent is present in an amount of 0.01 wt% to 2 wt%, based on the weight of the particulate mineral solid support.

13. The composition according to one of the preceding claims, wherein the amount of the dicarboxylic acid salt, in mg, on the surface of the particulate mineral solid support, in m^2, is from 0.15 mg/m^2 to 30 mg/m^2.

14. A process for the preparation of the composition according to one of the claims 1 to 13, comprising the following steps:

(i) providing a particulate mineral solid support which comprises a compound of a IUPAC Group 2 metal,

(ii) grinding the particulate mineral solid support in the presence of a dispersing and/or grinding agent, and

(iii) bringing the particulate mineral solid support into contact with a dicarboxylic acid having from 7 to 10 carbon atoms, wherein step (iii) is carried out during or after step (ii).

15. The process according to claim 14, wherein step (ii) comprises at least one wet grinding step and/or at least one dry grinding step, the dispersing and/or grinding agent of the wet grinding step preferably being a homo- or copolymer of a carboxylic acid salt, and/or the dispersing and/or grinding agent of the dry grinding step preferably being selected from glycols, polyglycols, polyalkylene glycols, sugars, alkanolamines, or mixtures thereof.

16. The process according to one of the claims 14 to 15, wherein step (iii) is carried out during the grinding step (ii) by mixing the particulate mineral solid support with the dispersing and/or grinding agent and the dicarboxylic acid and subsequently subjecting the mixture to the grinding step (ii); or wherein step (iii) is carried out after the grinding step (ii) by mixing the particulate mineral solid support with the dispersing and/or grinding agent, followed by subjecting the mixture to the grinding step (ii), and subsequently reacting the ground particulate mineral solid support with the dicarboxylic acid.

17. Use of the composition according to one of the claims 1 to 13 as a beta-nucleating agent for polypropylene.

Claims

1. A composition for beta-nucleation of polypropylene, comprising

(a) a particulate natural mineral solid support, comprising a compound of a IUPAC Group 2 metal, and

(b) on the surface of the particulate mineral solid support

(b1) a salt of a dicarboxylic acid, wherein the dicarboxylic acid has from 7 to 10 carbon atoms, and

(b2) a dispersing and/or grinding agent

wherein the compound of the IUPAC Group 2 metal is selected from natural ground calcium carbonate, calcium-magnesium carbonate or any mixture thereof; the natural ground calcium carbonate being selected from marble, limestone, chalk, or any mixture thereof; and the calcium-magnesium carbonate being dolomite.

2. The composition according to Claim 1, wherein the particulate mineral solid support comprises the compound of the IUPAC Group 2 metal in an amount of at least 50 wt%.

3. The composition according to one of the preceding claims, wherein the particulate mineral solid support and/or the composition has/have a medium particle size d_{50} of from 0.5 μm to 7 μm.

4. The composition according to one of the preceding claims, wherein the particulate mineral solid support and/or the composition has/have a specific surface area of from 0.5 m^2/g to 15 m^2/g, measured using nitrogen and the BET method according to ISO 9277.

5. The composition according to one of the preceding claims, wherein the salt of the dicarboxylic acid is a IUPAC Group 2 metal salt selected from a calcium salt, a magnesium salt, a strontium salt, or a mixture thereof.

6. The composition according to one of the preceding claims, wherein the dicarboxylic acid is selected from pimelic acid, suberic acid, azelaic acid, phthalic acid, isophthalic acid, terephthalic acid, or any mixture thereof.

7. The composition according to one of the preceding claims, wherein the salt of the dicarboxylic acid is present in an amount of 0.05 wt% to 10 wt%, based on the weight of the particulate mineral solid support.

8. The composition according to one of the preceding claims, wherein the dispersing and/or grinding agent is selected from a homo- or copolymer of a carboxylic acid salt, glycols, polyglycols, polyalkylene glycols, sugars, alkanolamines, or mixtures thereof.

9. The composition according to one of the preceding claims, wherein the dispersing and/or grinding agent is present in an amount of 0.01 wt% to 2 wt%, based on the weight of the particulate mineral solid support.

10. The composition according to one of the preceding claims, wherein the amount of the dicarboxylic acid salt, in mg, on the surface of the particulate mineral solid support, in m^2, is from 0.15 mg/m^2 to 30 mg/m^2.

11. A process for the preparation of the composition according to one of the claims 1 to 10, comprising the following steps:

    (i) providing a particulate mineral solid support which comprises a compound of a IUPAC Group 2 metal,

    (ii) grinding the particulate mineral solid support in the presence of a dispersing and/or grinding agent, and

    (iii) bringing the particulate mineral solid support into contact with a dicarboxylic acid having from 7 to 10 carbon atoms, wherein step (iii) is carried out during or after step (ii).

12. The process according to claim 11, wherein step (ii) comprises at least one wet grinding step and/or at least one dry grinding step, the dispersing and/or grinding agent of the wet grinding step preferably being a homo- or copolymer of a carboxylic acid salt, and/or the dispersing and/or grinding agent of the dry grinding step preferably being selected from glycols, polyglycols, polyalkylene glycols, sugars, alkanolamines, or mixtures thereof.

13. The process according to one of the claims 11 to 12, wherein step (iii) is carried out during the grinding step (ii) by mixing the particulate mineral solid support with the dispersing and/or grinding agent and the dicarboxylic acid and subsequently subjecting the mixture to the grinding step (ii); or wherein step (iii) is carried out after the grinding step (ii) by mixing the particulate mineral solid support with the dispersing and/or grinding agent, followed by subjecting the mixture to the grinding step (ii), and subsequently reacting the ground particulate mineral solid support with the dicarboxylic acid.

14. Use of the composition according to one of the claims 1 to 10 as a beta-nucleating agent for polypropylene.