Claims

1. A mineral composition comprising mineral particles, said mineral particles, when in a densely compacted bed form, having a volume defined median pore diameter from 0.01 to 0.04 micrometre, and having an intruded total specific void volume of 0.1-0.3 cm^3/g.

2. A mineral composition according to claim 1, said mineral particles, when in a densely compacted bed form, having a monomodal pore diameter distribution.

3. A mineral composition according to claim 2, said mineral particles, when in a densely compacted bed form, having a volume defined pore size polydispersity expressed as full width at maximum height (FWMH) in the range of 0.01 to 0.03 micrometre.

4. A mineral composition according to claim 1, said mineral particles, when in a densely compacted bed form, having a bi- or multimodal pore diameter distribution.

5. A mineral composition according to any one of the claims 1-4, said mineral particles comprising calcium carbonate, in particular chosen among natural calcium carbonate or precipitated calcium carbonate or their mixtures.

6. A mineral composition according to any one of the claims 1-5, wherein the formulation of the mineral composition is selected from the group consisting of a coating composition, filler, surface filling, and a mineral slurry.

7. A substrate comprising a mineral composition which comprises mineral particles, said mineral particles, when in a densely compacted bed form, having a volume defined median pore diameter from 0.01 to 0.04 micrometre, and having an intruded total specific void volume of 0.1-0.3 cm^3/g.

8. A substrate according to claim 7 comprising one or more formulations of the mineral composition, said formulation selected from the group consisting of a coating composition, filler, surface filling, and a mineral slurry or mixtures thereof.

9. A substrate according to claims 7-8, said substrate being selected from the group consisting of paper, cardboard, plastic, textile, wood, metal, concrete, or ointment.

10. A method for producing a mineral particle fine fraction from a feed material, the mineral particle fine fraction, when in a densely compacted bed form, having a volume defined median pore diameter from 0.01 to 0.04 micrometre, and having an intruded total specific void volume of 0.1-0.3 cm^3/g, the method comprising:

- providing the feed material to a milling machine, producing a first milled feed material,

- feeding the first milled feed material into a disc stack centrifuge, producing two mineral particle fractions, one being the mineral particle fine fraction and a second being a mineral particle coarse fraction,

- either feeding a part or all of the mineral particle coarse fraction to a milling machine and/or to a disc stack centrifuge and/or taking off a part or all of the mineral particle coarse fraction.

11. A method for producing a mineral particle fine fraction according to the claim 10, the mineral particle fine fraction, when in a densely compacted bed form, having a volume defined median pore diameter from 0.01 to 0.04 micrometre, and having an intruded total specific void volume of 0.1-0.3 cm^3/g, the method comprising:

- providing the feed material to a milling machine, producing a first milled feed material,

- feeding the first milled feed material into a disc stack centrifuge, producing two mineral particle fractions, one being the mineral particle fine fraction and a second being a mineral particle coarse fraction, wherein the first milled feed material has a solids contents in the range of 20%-80% by weight, preferably in the range of 30%-75% by weight, more preferably in the range of 38%-70% by weight.

12. A method for producing a mineral particle fine fraction, the mineral particle fine fraction, when in a densely compacted bed form, having a volume defined median pore diameter from 0.01 to 0.04 micrometre, and having an intruded total specific void volume of 0.1-0.3 cm^3/g, the method comprising:

- providing the feed material to one or more dry and/or wet grinding machines, producing said mineral particle fine fraction in one or more grinding steps.

13. A method according to any one of claims 10-12, said process functioning in a continuous manner.

14. A method according to any one of claims 10-13, said mineral particle fine fraction, when in a densely compacted bed form, having a monomodal pore diameter distribution.

15. A method according to claim 14, said mineral particle fine fraction, when in a densely compacted bed form, having a volume defined pore size polydispersity expressed as full width at maximum height (FWMH) in the range of 0.01 to 0.03 micrometre.

16. A method according to any one of claims 10-13, said mineral particle fine fraction, when in a densely compacted bed form, having a bi- or multimodal pore diameter distribution.

17. Use of a mineral composition according to any one of the claims 1-6 in paper application like paper manufacturing, paper coating, ink jet paper top-coating, offset printing.

18. Use of a mineral composition according to any one of the claims 1-6 in textile and cardboard application.

19. Use of a mineral composition according to any one of the claims 1-6 in wood, metal, concrete and ointment.

Claims

1. A mineral composition comprising calcium carbonate particles, when in a densely compacted bed form, having a monomodal pore diameter distribution, having a volume defined median pore diameter from 0.01 to 0.04 micrometre, having an intruded total specific void volume of 0.1 to 0.3 cm^3/g and having a volume defined pore size polydisperity expressed as full width at maximum height (FWMH) in the range of 0.01 to 0.03 micrometre.

2. A mineral composition according to claim 1, chosen among natural calcium carbonate or precipitated calcium carbonate or their mixtures.

3. A mineral composition according to claim 1 or 2, wherein the formulation of the mineral composition is selected from the group consisting of a coating composition, filler, surface filling, and a mineral slurry.

4. A substrate comprising a mineral composition which comprises mineral particles, said mineral particles, when in a densely compacted bed form, having a monomodal pore diameter distribution, having a volume defined median pore diameter from 0.01 to 0.04 micrometre, having an intruded total specific void volume of 0.1-0.3 cm^3/g and having a volume defined pore size polydisperity expressed as full width at maximum height (FWMH) in the range of 0.01 to 0.03 micrometre.

5. A substrate according to claim 4 comprising one or more formulations of the mineral composition, said formulation selected from the group consisting of a coating composition, filler, surface filling, and a mineral slurry or mixtures thereof.

6. A substrate according to claim 4 or 5, said substrate being selected from the group consisting of paper, cardboard, plastic, textile, wood, metal, concrete, or ointment.

7. A method for producing a mineral particle fine fraction from a feed material, the mineral particle fine fraction, when in a densely compacted bed form, having a monomodal pore diameter distribution, having a volume defined median pore diameter from 0.01 to 0.04 micrometre, having an intruded total specific void volume of 0.1-0.3 cm^3/g and having a volume defined pore size polydisperity expressed as full width at maximum height (FWMH) in the range of 0.01 to 0.03 micrometre, the method comprising:

   - providing the feed material to a milling machine, producing a first milled feed material,

   - feeding the first milled feed material into a disc stack centrifuge, producing two mineral particle fractions, one being the mineral particle fine fraction and a second being a mineral particle coarse fraction,

   - either feeding a part or all of the mineral particle coarse fraction to a milling machine and/or to a disc stack centrifuge and/or taking off a part or all of the mineral particle coarse fraction.

8. A method for producing a mineral particle fine fraction according to the claim 7, the mineral particle fine fraction, when in a densely compacted bed form, having a monomodal pore diameter distribution, having a volume defined median pore diameter from 0.01 to 0.04 micrometre, and having an intruded total specific void volume of 0.1-0.3 cm^3/g, and having a volume defined pore size polydisperity expressed as full width at maximum height (FWMH) in the range of 0.01 to 0.03 micrometre, the method comprising:

   - providing the feed material to a milling machine, producing a first milled feed material,

   - feeding the first milled feed material into a disc stack centrifuge, producing two mineral particle fractions, one being the mineral

particle fine fraction and a second being a mineral particle coarse fraction, wherein the first milled feed material has a solids contents in the range of 20%-80% by weight, preferably in the range of 30%-75% by weight, more preferably in the range of 38%-70% by weight.

9. A method for producing a mineral particle fine fraction, the mineral particle fine fraction, when in a densely compacted bed form, having a monomodal pore diameter distribution, having a volume defined median pore diameter from 0.01 to 0.04 micrometre, having an intruded total specific void volume of 0.1-0.3 cm^3/g and having a volume defined pore size polydisperity expressed as full width at maximum height (FWMH) in the range of 0.01 to 0.03 micrometre, the method comprising:

   - providing the feed material to one or more dry and/or wet grinding machines, producing said mineral particle fine fraction in one or more grinding steps.

10. A method according to any one of claims 7-9, said process functioning in a continuous manner.

11. Use of a mineral composition according to any one of the claims 1-3 in paper application like paper manufacturing, paper coating, ink jet paper top-coating, offset printing.

12. Use of a mineral composition according to any one of the claims 1-3 in textile and cardboard application.

13. Use of a mineral composition according to any one of the claims 1-3 in wood, metal, concrete and ointment.