Claims

1. A molding, comprising a microporous aluminum-free zeolitic material of structure type MWW containing titanium and zinc (ZnTiMWW), said molding preferably comprising a micropowder comprising, based on the weight of the micropowder, at least 95 weight-% of a microporous aluminum-free zeolitic material of structure type MWW containing titanium and zinc (ZnTiMWW), the molding preferably further comprising at least one binder, preferably a silica binder.

2. The molding of claim 1, comprising mesopores having an average pore diameter in the range of from 4 to 40 nm, preferably from 20 to 30 nm as determined by Hg porosimetry according to DIN 66133.

3. The molding of claim 1 or 2, having a crystallinity, as determined by XRD analysis, of at least (55 +/- 10) %, preferably in the range of from ((55 to 75) +/- 10) %.

4. The molding of any of claims 1 to 3, comprising the micropowder in an amount in the range of from 70 to 80 weight-% and the silica binder in an amount in the range of from 30 to 20 weight-%, the micropowder together with the silica binder constituting at least 99 weight-% of the molding, wherein the molding has a concentration of silanol groups with respect to the total number of Si atoms of at most 6 %, preferably at most 3 %, as determined according to ^{29}Si MAS NMR.

5. The molding of any of claims 1 to 4, being a strand having a circular cross-section and a diameter in the range of from 1.5 to 1.7 mm and having a crush strength of at least 5 N, preferably in the range of from 5 to 20 N, more preferably in the range of from 12 to 20 N, the crush strength being determined by crush strength test machine Z2.5/TS1S according to the method as described in the description.

6. The molding of any of claims 1 to 5, the ^{29}Si-NMR spectrum of said molding comprising six peaks at the following positions

peak 1 at -98 +/- x ppm,
peak 2 at -104 +/- x ppm,
peak 3 at -110 +/- x ppm,
peak 4 at -113 +/- x ppm,
peak 5 at -115 +/- x ppm,
peak 6 at -118 +/- x ppm,

with x in any of the peaks being 1.5, preferably 1.0, more preferably 0.5,
wherein Q which is defined as

$$Q = 100 * \{ [a_1+a_2] / [a_4+a_5+a_6] \} / a_3$$

is at most 2.5, preferably at most 1.6, preferably at most 1.4, with $[a_1+a_2]$ being the sum of the peak areas of peaks 1 and 2, and $[a_4 + a_5 + a_6]$ being the sum of the peak areas of peaks 4, 5, and 6, and a_3 being the peak area of peak 3.

7. The molding of any of claims 1 to 6, having a water uptake in the range of from 3 to 8 weight-%, preferably from 4 to 7 weight-%.

8. The molding of any of claims 1 to 7, the infrared spectrum of said molding comprising a band in the region of (3700 - 3750) +/- 20 cm^{-1} and a band in the region of (3670 - 3690) +/- 20 cm^{-1}, wherein the intensity ratio of the band in the region of (3700 - 3750) +/- 20 cm^{-1} relative to the band in the region of (3670 - 3690) +/- 20 cm^{-1} is at most 1.5, preferably at most 1.4.

9. The molding of any of claims 1 to 8 for use as a catalyst, preferably as catalyst for preparing propylene oxide from propene with hydrogen peroxide as oxidizing agent in acetonitrile as solvent in a continuous process, wherein the selectivity with respect to propylene oxide relative to hydrogen peroxide after a run-time of 500 h is at least 95 %, preferably at least 96 %.

10. A process comprising
    (i) providing a suspension containing a microporous aluminum-free zeolitic material of structure type MWW containing titanium and zinc (ZnTiMWW);
    (ii) subjecting the suspension provided in (i) to spray-drying to obtain a micropowder;
    (iii) optionally calcining the micropowder obtained in (ii).

11. The process of claim 10, wherein the suspension provided in (i) has a solid content in the range of from 5 to 25 weight-%, preferably of from 10 to 20 weight-%, the suspension preferably being an aqueous suspension.

12. The process of claim 10 or 11, wherein the ZnTiMWW according to (i) contains zinc in an amount of from 1.0 to 2.0 weight-%, preferably of from 1.2 to 1.9 weight-%, calculated as Zn, and titanium in an amount of from 1.0 to 2.0 weight-%, preferably of from 1.2 to 1.8 weight-%, calculated as Ti and based on the weight of the ZnTiMWW.

13. The process of any of claims 10 to 12, wherein in (ii), a spray-apparatus, preferably a spray-tower is used for spray-drying the suspension, said apparatus having at least one spray-nozzle, preferably at least one two-component nozzle, said nozzle having a diameter in the range of from 3.5 to 4.5 mm.

14. The process of any of claims 10 to 13, wherein in (iii), the micropowder is calcined at a temperature in the range of from 600 to 700 °C for a duration in the range of from 0.5 to 6 h.

15. The process of any of claims 10 to 14, further comprising
(iv) shaping the micropowder obtained in (ii) or (iii) to obtain a molding;
(v) optionally drying and/or calcining the molding obtained in (iv).

16. The process of claim 15, wherein the shaping according to (iv) comprises
(aa) mixing the micropowder with a binder or a binder precursor, preferably a silica binder or a silica binder precursor, wherein the weight ratio of the ZnTiMWW contained in the micropowder relative to silica contained in or resulting from the silica binder is in the range of from 3:7 to 1:4, to obtain a mixture;
(bb) shaping the mixture obtained in (aa) to obtain the molding, said shaping preferably comprising subjecting the mixture obtained in (aa) to extrusion from which preferably strands are obtained having a diameter preferably in the range of from 1.0 to 2.0 mm, more preferably of from 1.5 to 1.7 mm.

17. The process of claim 16, wherein in (aa), a carbohydrate and/or water is/are added as pasting agent.

18. The process of claim 16 or 17, wherein the mixing in (aa) is carried out for a duration in the range of from 15 to 60 min, preferably of from 30 to 55 min, more preferably of from 40 to 50 min.

19. The process of any of claims 16 to 18, wherein in (iv), no mesopore-forming agent selected from the group consisting of polyalkylene oxides such as polyethylene oxides, polystyrene, polyacrylates, polymethacrylates, polyolefins, polyamides, and polyesters is added.

20. The process of any of claims 16 to 19, wherein in (v), the molding is dried at a temperature in the range of from 100 to 150 °C for a duration in the range of from 10 to 20 h and calcined at a temperature in the range of from 500 to 600 °C for a duration in the range of from 0.5 to 2 h.

21. The process of any of claims 16 to 20, further comprising
(vi) subjecting the molding obtained in (iv) or (v), preferably in (v), to a water-treatment;
(vii) optionally drying and/or calcining the water-treated molding,
wherein the molding obtained in (vi) or (vii), preferably in (vii), is preferably the molding according to any of claims 1 to 9.

22. The process of claim 21, wherein in (vi), the water-treatment comprises treating the molding with liquid water in an autoclave under autogenous pressure at a temperature in the range of from 100 to 200 °C, preferably of from 125 to 175 °C, more preferably of from 140 to 150 °C for a period of from 2 to 24 hours, preferably of from 6 to 10 h.

23. The process of claim 21 or 22, wherein in (vi), the weight ratio of the molding relative to the water is in the range of from 0.02 to 0.08, preferably of from 0.03 to 0.07, more preferably of from 0.04 to 0.06.

24. The process of any of claims 21 to 23, wherein in (vii), the water-treated molding is dried at a temperature in the range of from 100 to 150 °C for a duration in the range of from 10 to 20 h and calcined at a temperature in the range of from 400 to 500 °C for a duration in the range of from 1 to 3 h.

25. The process of any of claims 21 to 24, wherein the molding is not subjected to steaming.

26. A micropowder, obtainable or obtained by a process according to any of claims 10 to 14.

27. A molding, obtainable or obtained by a process according to any of claims 15 to 25.

28. Use of the micropowder according to claim 26 or of the molding according to any of claims 1 to 8 or according to claim 27, as a catalyst, preferably as a catalyst for preparing propylene oxide from propene with hydrogen peroxide as oxidizing agent in acetonitrile as solvent.