Both the steam treatment and the acid treatment may have a significant influence on the properties of the zeolitic material. By subjecting a zeolitic material comprising both trivalent and tetravalent structural components X and Y as $X_2O_3$ and $YO_2$, respectively, to a steam treatment and/or an acid treatment, the molar ratio $X_2O_3$ : $YO_2$ is decreased. However, it was found that also the crystallinity of the zeolitic materials is decreased by the steam treatment and/or acid treatment, and further, that the hydrophobicity of the zeolitic materials respectively decreases. Therefore, both the steam treatment and the acid treatment may result in a partial transformation of the crystalline material into an amorphous material.

Thus, it was an object of the embodiments disclosed herein to provide a process for the post-treatment of a zeolitic material which does not exhibit said disadvantage.

Further, it was an object of the embodiments disclosed herein to provide a post-treated zeolitic material having a low molar ratio $X_2O_3$ : $YO_2$ and simultaneously a high crystallinity.

It was surprisingly found that a post-treatment process which includes subjecting a zeolitic material to a treatment with a liquid solvent system to decrease the molar ratio $X_2O_3$ : $YO_2$ followed by a treatment with a liquid aqueous system having a pH in the range of 5.5 to 8 at elevated temperatures of at least 75 °C avoids that disadvantages.

In an aspect, there is provided a process for the post-treatment of a zeolitic material having an MWW framework structure, the process comprising

(i) providing a zeolitic material having an MWW framework structure, wherein the framework structure of the zeolitic material comprises $X_2O_3$ and $YO_2$, wherein Y is a tetravalent element and X is a trivalent element and wherein the molar ratio $X_2O_3$: $YO_2$ is greater than 0.02 : 1;

(ii) treating the zeolitic material provided in (i) with a liquid solvent system thereby obtaining a zeolitic material having a molar ratio $X_2O_3$ : $YO_2$ of at most 0.02 : 1, and at least partially separating the zeolitic material from the liquid solvent system;

(iii) treating the zeolitic material obtained from (ii) with a liquid aqueous system having a pH in the range of 5.5 to 8 and a temperature of at least 75 °C in a closed system under autogenous pressure;

wherein the pH of the aqueous system used in (iii) is determined using a pH sensitive glass electrode.

In another aspect, there is provided a zeolitic material having an MWW framework structure, wherein the framework structure comprises $YO_2$ and $X_2O_3$, wherein Y is a tetravalent element selected from the group consisting of Si, Ti, Sn, Zr, Ge, and combinations of two or more thereof, and X is B, said zeolitic material having a molar ratio $X_2O_3 : YO_2$ of at most 0.02 : 1, a crystallinity, as determined by XRD analysis, of at least 75 % and a water uptake of at most 11 weight-%.

In another aspect, there is provided the zeolitic material as defined above, obtainable or obtained by the process as defined above.

In another aspect, there is provided the use of a zeolitic material as defined above as a catalyst, as a catalyst precursor, or as a catalyst component.

Therefore, the present invention relates to a process for the post-treatment of a zeolitic material having an MWW framework structure, the process comprising

(i) *providing a zeolitic material having an MWW framework structure, wherein the* framework structure of the zeolitic material comprises $X_2O_3$ and $YO_2$, wherein Y is a tetravalent element and X is a trivalent element and wherein the molar ratio $X_2O_3 : YO_2$ is greater than 0.02 : 1;

(ii) treating the zeolitic material provided in (i) with a liquid solvent system thereby obtaining a zeolitic material having a molar ratio $X_2O_3 : YO_2$ of at most 0.02 : 1, and at least partially separating the zeolitic material from the liquid solvent system;

(iii) treating the zeolitic material obtained from (ii) with a liquid aqueous system having a pH in the range of from 5.5 to 8 and a temperature of at least 75 °C;

wherein the pH of the aqueous system used in (iii) is determined using a pH sensitive glass electrode.

Step (i)

According to the present invention, $X_2O_3$ and $YO_2$ comprised in the MWW framework structure of the zeolitic material provided in (i) are contained therein as structure build-

## Claims

1. A process for the post-treatment of a zeolitic material having an MWW framework structure, the process comprising
   (i) providing a zeolitic material having an MWW framework structure, wherein the framework structure of the zeolitic material comprises $X_2O_3$ and $YO_2$, wherein Y is a tetravalent element and X is a trivalent element and wherein the molar ratio $X_2O_3$: $YO_2$ is greater than 0.02 : 1;
   (ii) treating the zeolitic material provided in (i) with a liquid solvent system thereby obtaining a zeolitic material having a molar ratio $X_2O_3$ : $YO_2$ of at most 0.02 : 1, and at least partially separating the zeolitic material from the liquid solvent system;
   (iii) treating the zeolitic material obtained from (ii) with a liquid aqueous system having a pH in the range of 5.5 to 8 and a temperature of at least 75 °C in a closed system under autogenous pressure;
   wherein the pH of the aqueous system used in (iii) is determined using a pH sensitive glass electrode.

2. The process of claim 1, wherein Y is selected from the group consisting of Si, Ti, Sn, Zr, Ge, and combinations of two or more thereof, Y preferably being Si, and wherein X is selected from the group consisting of Al, B, In, Ga, Fe and combinations of two or more thereof, X preferably being B.

3. The process of claim 1 or 2, wherein in (i), at least 95 weight-%, preferably at least 98 weight-%, more preferably at least 99 weight-% of the framework structure of the zeolitic material consist of $X_2O_3$ and $YO_2$.

4. The process of any of claims 1 to 3, wherein in (i), the molar ratio $X_2O_3$ : $YO_2$ is at least 0.03 : 1, preferably in the range of from 0.03 : 1 to 0.07 : 1, more preferably from 0.03 : 1 to 0.06 : 1, more preferably from 0.03 : 1 to 0.05 : 1.

5. The process of any of claims 1 to 4, wherein in (i), the zeolitic material having an MWW framework structure is provided by a process comprising
   (a) hydrothermally synthesizing the zeolitic material from a synthesis mixture containing at least one silicon source, preferably ammonia stabilized colloidal silica, at least one boron source, preferably boric acid, and at least one template compound, preferably selected from the group consisting of piperidine, hexamethylene imine, N,N,N,N',N',N'-hexamethyl-1,5-pentanediammonium ion, 1,4-bis(N-methylpyrrolidinium)butane,

octyltrimethylammonium hydroxide, heptyltrimethylammonium hydroxide, hexyltrimethylammonium hydroxide and a mixture of two or more thereof, to obtain the zeolitic material in its mother liquor;

(b) separating the zeolitic material from its mother liquor.

6. The process of claim 5, wherein (b) comprises drying, preferably spray-drying of the zeolitic material, wherein during spray-drying, the drying gas inlet temperature is preferably in the range of from 200 to 250 °C and the drying gas outlet temperature is preferably in the range of from 100 to 175 °C.

7. The process of claim 5 or 6, wherein after (b) and prior to (ii), the zeolitic material, optionally after drying, preferably spray-drying, is subjected to calcination.

8. The process of claim 7, wherein the calcination is carried out at a temperature in the range of from 400 to 700 °C, preferably from 550 to 650 °C, for a period in the range of from 1 to 10 h, preferably from 2 to 6 h.

9. The process of any of claims 1 to 8, wherein in (ii), the liquid solvent system is selected from the group consisting of water, methanol, ethanol, propanol, ethane-1,2-diol, propane-1,2-diol, propane-1,3-diol, propane-1,2,3-triol, and mixtures of two or more thereof, preferably water, wherein preferably, the liquid solvent system does not contain an inorganic or organic acid, or a salt thereof.

10. The process of claim 9, wherein in (ii), the treating is carried out at a temperature in the range of from 50 to 125 °C, preferably from 90 to 115 °C, more preferably from 95 to 105 °C, for a period in the range of from 6 to 20 h, preferably from 7 to 17 h, more preferably from 8 to 12 h.

11. The process of claim 10, wherein in (ii), the treating is carried out in an open system under reflux.

12. The process of any of claims 1 to 11, wherein in (ii), the separated zeolitic material is subjected to drying, the drying preferably being carried out at a temperature in the range of from 100 to 180 °C, preferably from 120 to 150 °C, for a period in the range of from 10 to 70 h, preferably from 15 to 25 h.

13. The process of any of claims 1 to 12, wherein in (ii), the separated and preferably dried zeolitic material is subjected to calcination, the calcination preferably being

carried out at a temperature in the range of from 400 to 700 °C, preferably from 550 to 650 °C, for a period in the range of from 1 to 10 h, preferably from 2 to 6 h.

14. The process of any of claims 1 to 13, wherein the zeolitic material obtained in (ii) has a molar ratio $X_2O_3$ : $YO_2$ of at most 0.01 : 1, preferably in the range of from 0.001 : 1 to 0.01 : 1, more preferably from 0.001 : 1 to 0.003.

15. The process of any of claims 1 to 14, wherein the zeolitic material obtained from (ii) is in the form of a powder, preferably in the form of a spray powder.

16. The process of any of claims 1 to 15, wherein in (iii), the zeolitic material is treated with the liquid aqueous system for a period in the range of from 0.5 to 24 h, preferably from 1 to 18 h, more preferably from 8 to 14 h.

17. The process of any of claims 1 to 16, wherein in (iii), the zeolitic material is treated with the liquid aqueous system at a temperature in the range of from 75 to 200 °C, preferably from 90 to 180 °C, more preferably from 100 to 160 °C, more preferably from 110 to 150 °C.

18. The process of any of claims 1 to 17, wherein the liquid aqueous system used in (iii) has a pH in the range of from 6 to 7.5, preferably from 6.5 to 7.5.

19. The process of any of claims 1 to 18, wherein in (iii), the weight ratio of the liquid aqueous system relative to the zeolitic material is in the range of from 35:1 to 5:1, preferably from 30:1 to 10:1, more preferably from 25:1 to 15:1.

20. The process of any of claims 1 to 19, wherein in (iii), the liquid aqueous system comprises at least 90 weight-%, preferably al least 99 weight-%, more preferably at least 99.9 weight-% water.

21. The process of any of claims 1 to 20, wherein in (iii), the zeolitic material is treated with the liquid aqueous system in an autoclave.

22. The process of any of claims 1 to 21, wherein in (iii), the treated zeolitic material is subjected to drying, the drying preferably being carried out at a temperature in the range of from 100 to 180 °C, preferably from 120 to 150 °C, for a period in the range of from 5 to 70 h, preferably from 10 to 20 h.

23. The process of any of claims 1 to 22, wherein in (iii), the treated zeolitic material, preferably after drying, is subjected to calcination, the calcination preferably being carried out at a temperature in the range of from 350 to 600 °C, preferably from 400 to 500 °C, for a period in the range of from 1 to 10 h, preferably from 2 to 6 h.

24. The process of any of claims 1 to 23, wherein neither prior to nor during nor after (iii), the zeolitic material is subjected to steam treatment and/or wherein neither during nor after (iii), preferably neither prior to nor during nor after (iii), the zeolitic material is subjected to a treatment with an aqueous solution having a pH of below 5.5 or above 8, wherein the pH of the aqueous system used in (iii) is determined using a pH sensitive glass electrode.

25. A zeolitic material having an MWW framework structure, wherein the framework structure comprises $YO_2$ and $X_2O_3$, wherein Y is a tetravalent element selected from the group consisting of Si, Ti, Sn, Zr, Ge, and combinations of two or more thereof, and X is B, said zeolitic material having a molar ratio $X_2O_3$ : $YO_2$ of at most 0.02 : 1, a crystallinity, as determined by XRD analysis, of at least 75 % and a water uptake of at most 11 weight-%.

26. The zeolitic material of claim 25, wherein the molar ratio $X_2O_3$ : $YO_2$ is at most 0.01 : 1, preferably in the range of from 0.001 : 1 to 0.01 : 1, more preferably from 0.001 : 1 to 0.003 : 1, wherein the crystallinity of the zeolitic material is in the range of from 75 to 90 %, preferably from 75 to 85 %, and wherein the water uptake of the zeolitic material is in the range of from 4 to 11 weight-%, preferably from 6 to 10 weight-%.

27. The zeolitic material of claim 25 or 26, wherein the IR spectrum of the zeolitic material exhibits a first absorption band with a maximum in the range of from 3710 to 3750 $cm^{-1}$ and a second absorption band with a maximum in the range of from 3480 to 3540 $cm^{-1}$, wherein the ratio of the intensity of the first absorption band relative to the intensity of the second absorption band is at least 1.0, preferabl in the range of from 1.0 to 1.3, and wherein the $^{29}Si$-NMR spectrum of the zeolitic material comprises
    - a first peak at -99.0 ppm +/- 3.0 ppm, preferably +/- 2.5 ppm,
    - a second peak at -104.9 ppm +/- 0.9 ppm, preferably +/- 0.5 ppm,
    - a third peak at -110.7 ppm +/- 0.7 ppm, preferably +/- 0.4 ppm,
    - a fourth peak at -112.5 ppm +/- 1.5 ppm, preferably +/- 1.0 ppm,
    - a fifth peak at -115.1 ppm +/- 0.7 ppm, preferably +/- 0.4 ppm,
    - a sixth peak at -118.9 ppm +/- 0.7 ppm, preferably +/- 0.4 ppm,

wherein the integral of the sixth peak is at least 5 %, preferably at least 7 %, more preferably at least 9 % of the total integral.

28. The zeolitic material of any of claims 25 to 27, wherein Y is Si.

29. The zeolitic material of any of claims 25 to 28, being in the form of a powder, preferably in the form of a spray powder.

30. The zeolitic material according to any of claims 25 to 29, obtainable or obtained by the process according to any of claims 1 to 24.

31. Use of a zeolitic material according to any of claims 25 to 30 as a catalyst, as a catalyst precursor, or as a catalyst component.