CLAIMS

What is claimed is:

1. A process for the manufacture of a synthetic porous crystalline molecular sieve, ~~which process comprises~~ comprising the steps of:

(a) forming an aqueous reaction mixture~~,~~ that is free of ~~organic~~ organic-containing structure directing agent~~, comprising~~ and consisting of a source of X_2O_3, a source of YO_2, and a source of metal hydroxide MOH, wherein X is a trivalent element, Y is a tetravalent element and M represents an alkali metal, ~~in which~~ and wherein the aqueous reaction mixture has:

(i) ~~the~~ a molar ratio of H_2O/MOH that is 75 or less, and

(ii) at least a portion of the X_2O_3 and the YO_2 ~~is~~ provided by an amorphous material containing both X_2O_3 and YO_2, ~~said~~ the amorphous material having a YO_2/X_2O_3 molar ratio within the range of from 15 to 40;

(b) crystallizing the reaction mixture to produce the porous crystalline molecular sieve; and

(c) recovering the ~~crystallized material~~ synthetic porous crystalline molecular sieve.

2. The process according to claim 1, wherein X is aluminium and Y is silicon.

3. The process according to claim 1 ~~or 2~~, wherein crystallization is effected at a temperature of 80 to 225 °C~~, preferably of 100 to 200 °C~~.

4. The process according to claim 3, wherein crystallization is effected at a temperature of 100 to 200 °C.

~~4.~~5. The process according to ~~any of the preceding claims~~ claim 1, wherein the molar ratio of H_2O/MOH in the reaction mixture is within the range of 20 to 50.

~~5.~~6. The process according to ~~any of the preceding claims~~ claim 1, wherein the amorphous material containing both X_2O_3 and YO_2 comprises less than 1.0 wt % Na_2O~~, preferably less than 0.01 wt% NA_2O~~.

7. The process according to claim 6, wherein the amorphous material containing

both X_2O_3 and YO_2 comprises less than 0.01 wt% Na_2O.

~~6.~~8. The process according to ~~any of the preceding claims~~ claim 1, wherein, in addition to the amorphous material containing both X_2O_3 and YO_2, the aqueous reaction mixture also comprises a separate source of X_2O_3.

~~7.~~9. The process according to claim ~~6~~ 8, wherein the separate source of X_2O_3 contributes 50% or less~~, preferably from 20% to 45%~~ of the total amount of X_2O_3 in the aqueous reaction mixture.

10. The process according to claim 9, wherein the separate source of X_2O_3 contributes from 20% to 45% of the total amount of X_2O_3 in the aqueous reaction mixture.

~~8.~~11. The process according to ~~any of the preceding claims~~ claim 1, wherein the amorphous material containing both X_2O_3 and YO_2 has a YO_2/X_2O_3 molar ratio within the range of from 15 to 35~~, preferably within the range of from 15 to 32, more preferably within the range of from 15 to 30~~.

12. The process according to claim 11, wherein the amorphous material containing both X_2O_3 and YO_2 has a YO_2/X_2O_3 molar ratio within the range of from 15 to 32.

13. The process according to claim 12, wherein the amorphous material containing both X_2O_3 nd YO_2 has a YO_2/X_2O_3 molar ratio within the range of from 15 to 30.

~~9.~~14. The process according to ~~any of the preceding claims~~ claim 1, wherein the alkali metal M is sodium or potassium.

~~10. A synthetic porous molecular sieve of the MFI structure type comprising crystals with at least one dimension greater than 10 μm, and comprising~~

~~$(n)SiO_2 : Al_2O_3$~~

~~wherein n is from 2 to 26.~~

~~11. The molecular sieve according to claim 10 characterized by a 30% orthoxylene sorption time test value of at least 50 minutes.~~

~~12. A method for the manufacture of an active catalyst comprising crystals having at least one dimension greater than 1 μm, which method comprises hydrogen exchange and calcination of the molecular sieve produced by the process of any of claims 1 to 9.~~

~~13. A method for the manufacture of an active catalyst comprising crystals having at least one dimension greater than 10 μm, which method comprises hydrogen exchange and calcination of the molecular sieve according to claims 10 or 11.~~

~~14. A process for converting hydrocarbons comprising contacting a hydrocarbon feedstream under hydrocarbon conversion conditions with a molecular sieve according to any of claims 10 or 11 or manufactured by the process of any of claims 1 to 9 or with a catalyst manufactured by the method of any of claims 12 or 13, to effect conversion of the hydrocarbon feedstream.~~

~~15. An absorption process which comprises contacting a feedstream containing one or more absorbates under absorption conditions with a molecular sieve according to any of claims 10 or 11 or manufactured by the process of any of claims 1 to 9 or with a catalyst manufactured by the method of any of claims 12 or 13, to effect absorption of one or more of the absorbates from the feedstream.~~

15. The process according to claim 1, wherein the synthetic porous crystalline molecular sieve has the MFI structure type in the non-calcined state, and comprises crystals having at least one dimension greater than 1 μm.

16. The process according to claim 1, wherein the synthetic porous crystalline molecular sieve is of the MFI structure type and comprises crystals with at least one dimension greater than 3 μm.

17. The process according to claim 16, wherein the synthetic porous crystalline molecular sieve comprises crystals with at least one dimension greater than 10 μm.

18. The process according to claim 15, wherein the synthetic porous crystalline molecular sieve comprises:

$$(n)YO_2:X_2O_3,$$

wherein Y is a tetravalent element; X is a trivalent element and n is at least 2 and less and less than 30.

19. The process according to claim 18, wherein the synthetic porous crystalline molecular sieve has n from 2 to 26.

20. The process according to claim 15, wherein the synthetic porous crystalline molecular sieve comprises aluminum.

21. The process according to claim 15, wherein the synthetic porous crystalline molecular sieve comprises silicon.

22. The process according to claim 15, wherein the synthetic porous crystalline molecular sieve is an aluminosilicate.

23. The process according to claim 15, wherein the synthetic porous crystalline molecular sieve is characterized by a 30% ortho-xylene sorption time test value of at least 50 minutes.

24. The process according to claim 15, further comprising the steps of hydrogen exchange and calcination of the synthetic porous crystalline molecular sieve to produce an active catalyst comprising crystals having at least one dimension greater than 1 μm.

25. A process for converting hydrocarbons comprising the steps of:

(a) forming an aqueous reaction mixture that is free of organic-containing structure directing agent and consisting of a source of X_2O_3, a source of YO_2, and a source of metal hydroxide MOH, wherein X is a trivalent element, Y is a tetravalent element and M represents an alkali metal, and wherein the aqueous reaction mixture has:

(i) a molar ratio of H_2O/MOH that is 75 or less, and

(ii) at least a portion of the X_2O_3 and the YO_2 provided by an amorphous material containing both X_2O_3 and YO_2, said amorphous material having a YO_2/X_2O_3 molar ratio within the range of from 15 to 40;

(b) crystallizing the reaction mixture to produce the porous crystalline molecular sieve;

(c) recovering the synthetic porous crystalline molecular sieve; and

(d) contacting a hydrocarbon feedstream under hydrocarbon conversion conditions with the synthetic porous crystalline molecular sieve to effect conversion of the hydrocarbon feedstream.

26. An absorption process comprising the steps of:

(a) forming an aqueous reaction mixture that is free of organic-containing structure directing agent and consisting of a source of X_2O_3, a source of YO_2, and a source of metal hydroxide MOH, wherein X is a trivalent element, Y is a tetravalent element and M represents an alkali metal, and wherein the aqueous reaction mixture has:

(i) a molar ratio of H_2O/MOH that is 75 or less, and

(ii) at least a portion of the X_2O_3 and the YO_2 provided by an amorphous material containing both X_2O_3 and YO_2, said amorphous material having a YO_2/X_2O_3 molar ratio within the range of from 15 to 40;

(b) crystallizing the reaction mixture to produce the porous crystalline molecular sieve;

(c) recovering the synthetic porous crystalline molecular sieve; and

(d) contacting a feedstream containing one or more absorbates under absorption conditions with the synthetic porous crystalline molecular sieve to effect absorption of one or more of the absorbates from the feedstream.