CLAIMS:

~~1. A molecular sieve having the structure of ZSM-18 and comprising cations of formula~~ $(CH_3)_3N^+(CH_2)_4N^+(CH_3)_3$ in its pores.

2. The molecular sieve of claim 1, having a composition comprising the molar relationship:

$$mM:qQ:(y)YO_2: X_2O_3,$$

wherein $0 < m \leq 2$, $0 < q \leq 1.2$, $7 \leq y \leq 14$, M comprises a cation selected from the group consisting of lithium, strontium, sodium, tetraalkylammonium and mixtures thereof, Q comprises a butamethonium cation, X is a trivalent element and Y is a tetravalent element.

3. The molecular sieve of claim 2, wherein said tetraalkylammonium cation comprises a tetramethylammonium cation.

4. The molecular sieve of claim 1 or claim 2, having in its calcined form an N_2 micropore volume of 0.34 (± 0.04) cc/g.

5. A process for producing a molecular sieve having the structure of ZSM-18, the process comprising the steps of:

(i) preparing a synthesis mixture capable of forming said molecular sieve, said synthesis mixture comprising water, a source of an oxide of a tetravalent element (Y), a source of an oxide of a trivalent element (X), a source of a first cation Q selected from the group consisting of either cations of formula $(CH_3)_3N^+(CH_2)_4N^+(CH_3)_3$ or N,N,N,-trimethyl-N-butylammonium cations and a source of at least one second cation M of valence n, wherein the second cation M is selected from the group consisting of lithium, strontium, sodium, tetraalkylammonium and mixtures thereof when said first cation Q is a cation of formula $(CH_3)_3N^+(CH_2)_4N^+(CH_3)_3$, and wherein said second cation M is tetramethylammonium when said first cation Q is N,N,N,-trimethyl-N-butylammonium cations, and said synthesis mixture having a composition, in terms of mole ratios, within the following ranges:

YO_2/X_2O_3	about 6 to about 25;
$(nM^{n+})/X_2O_3$	about 0.25 to about 4;
Q/X_2O_3	greater than 4; and
H_2O/YO_2	about 10 to about 60;

(ii) heating said synthesis mixture under crystallization conditions comprising a temperature of from about 100°C to about 200°C and a time from about 1 day to about 21 days until crystals of said molecular sieve are formed; and

~~(iii) recovering said molecular sieve from step (ii).~~

6. The process of claim 5, wherein said tetravalent element Y comprises silicon and said trivalent element X comprises aluminum.

7. The process of claim 5 or claim 6, wherein said first cation Q comprises cations of formula $(CH_3)_3N^+(CH_2)_4N^+(CH_3)_3$.

8. The process of claim 7, wherein said second cation M is lithium and Li^+/X_2O_3 is about 0.3 to about 2.

9. The process of claim 7, wherein said second cation M is strontium and $2Sr^{2+}/X_2O_3$ is about 0.3 to about 1.

10. The process of claim 7, wherein said second cation M is tetramethylammonium (TMA) and TMA^+/X_2O_3 is about 0.3 to about 4.

11. The process of claim 7, wherein said second cation M is a mixture of lithium and tetramethylammonium (TMA) and $(Li^+ + TMA^+)/X_2O_3$ is about 0.3 to about 4.

12. The process of claim 7, wherein said second cation M is a mixture of sodium and strontium and $(Na^+ + 2Sr^{2+})/X_2O_3$ is about 0.3 to about 2.

13. The process of claim 7, wherein said second cation M is a mixture of tetramethylammonium (TMA) and strontium and $(TMA^+ + 2Sr^{2+})/X_2O_3$ is about 0.3 to about 2.

14. The process of any of claims 5 to 13, wherein said synthesis mixture also contains seeds.

15. The process of any of claims 5 to 13, wherein said synthesis mixture further comprises from about 0.01 ppm by weight to about 10,000 ppm by weight of seeds.

16. The process of any of claims 5 to 13, wherein said synthesis mixture further comprises from about 100 ppm by weight to about 5,000 by weight of seeds.

17. The process of any of claims 14 to 16, wherein said seeds comprise a crystalline material having a MEI framework-type.

18. A molecular sieve material produced by the process of claim 5.

19. A process for converting a feedstock comprising an organic compound to a conversion product which comprises contacting said feedstock at organic compound conversion conditions with a catalyst comprising an active form of said molecular sieve of any one of claims 1 to 4 or 18.

CLAIMS:

1. A molecular sieve having the structure of ZSM-18 and comprising butamethonium cations of formula $(CH_3)_3N^+(CH_2)_4N^+(CH_3)_3$ in its pores.

2. The molecular sieve of claim 1, having a composition comprising the molar relationship:

$$mM:qQ:(y)YO_2: X_2O_3,$$

wherein $0 < m \leq 2$, $0 < q \leq 1.2$, $7 \leq y \leq 14$, M comprises a cation selected from the group consisting of lithium, strontium, sodium, tetramethylammonium and mixtures thereof, Q comprises a butamethonium cation, X is a trivalent element and Y is a tetravalent element.

3. The molecular sieve of claim 2, wherein M is a tetramethylammonium cation.

4. The molecular sieve of claim 1 or claim 2, having in its calcined form an N_2 micropore volume of 0.34 (± 0.04) cc/g.

5. A process for producing a molecular sieve having the structure of ZSM-18, the process comprising the steps of:

(i) preparing a synthesis mixture capable of forming said molecular sieve, said synthesis mixture comprising water, a source of an oxide of a tetravalent element (Y), a source of an oxide of a trivalent element (X), a source of a first cation Q selected from the group consisting of either cations of formula $(CH_3)_3N^+(CH_2)_4N^+(CH_3)_3$ or N,N,N,-trimethyl-N-butylammonium cations and a source of at least one second cation M of valence n, wherein the second cation M is selected from the group consisting of lithium, strontium, sodium, tetramethylammonium and mixtures thereof when said first cation Q is a cation of formula $(CH_3)_3N^+(CH_2)_4N^+(CH_3)_3$, and wherein said second cation M is tetramethylammonium when said first cation Q is N,N,N,-trimethyl-N-butylammonium cations, and said synthesis mixture having a composition, in terms of mole ratios, within the following ranges:

YO_2/X_2O_3	6 to 25;
$(nM^{n+})/X_2O_3$	0.25 to 4;
Q/X_2O_3	greater than 4; and
H_2O/YO_2	10 to 60;

(ii) heating said synthesis mixture under crystallization conditions comprising a temperature of from 100°C to 200°C and a time from 1 day to 21 days until crystals of said molecular sieve are formed; and

(iii) recovering said molecular sieve from step (ii).

6. The process of claim 5, wherein said tetravalent element Y comprises silicon and said trivalent element X comprises aluminum.

7. The process of claim 5 or claim 6, wherein said first cation Q comprises cations of formula $(CH_3)_3N^+(CH_2)_4N^+(CH_3)_3$.

8. The process of claim 7, wherein said second cation M is lithium and Li^+/X_2O_3 is 0.3 to 2.

9. The process of claim 7, wherein said second cation M is strontium and $2Sr^{2+}/X_2O_3$ is about 0.3 to about 1.

10. The process of claim 7, wherein said second cation M is tetramethylammonium (TMA) and TMA^+/X_2O_3 is 0.3 to 4.

11. The process of claim 7, wherein said second cation M is a mixture of lithium and tetramethylammonium (TMA) and $(Li^+ + TMA^+)/X_2O_3$ is 0.3 to 4.

12. The process of claim 7, wherein said second cation M is a mixture of sodium and strontium and $(Na^+ + 2Sr^{2+})/X_2O_3$ is 0.3 to 2.

13. The process of claim 7, wherein said second cation M is a mixture of tetramethylammonium (TMA) and strontium and $(TMA^+ + 2Sr^{2+})/X_2O_3$ is 0.3 to 2.

14. The process of any of claims 5 to 13, wherein said synthesis mixture also contains seeds.

15. The process of claim 14, wherein said synthesis mixture comprises from 0.01 ppm by weight to 10,000 ppm by weight of seeds, preferably from 100 ppm by weight to 5,000 by weight of seeds, said seeds preferably being a crystalline material having a MEI framework-type.