CLAIMS

1. A crystalline molecular sieve having the framework structure of ZSM-5, said molecular sieve having an X-ray diffraction pattern~~, said molecular sieve~~ having at least the following features:

(i) a first peak with a maximum at 8.90 (± 0.30) degrees two-theta which has an intensity above background of $Imax_A$, and which intersects a second peak with a maximum at 7.96 (± 0.30) degrees two-theta, to form a local minimum which has an intensity above background of $Imin_A$, such that the $Imin_A/Imax_A$ ratio is > 0.33; and

(ii) a third peak with a maximum at 24.0 (± 0.30) degrees two-theta~~.~~

~~2. The molecular sieve of claim 1, wherein said third peak~~ which has an intensity above background of $Imax_B$, and intersects a fourth peak with a maximum at 23.2 (± 0.20) degrees two-theta, such that said intersection of said third and said fourth peaks forms a local minimum which has an intensity above background of $Imin_B$, such that the $Imin_B/Imax_B$ ratio is > 0.90.

~~3~~2. The molecular sieve of claim 1 ~~or claim 2~~ and comprising crystals having an external surface area (as determined by the t-plot method for nitrogen physisorption) in excess of 100 m^2/g.

~~4~~3. The molecular sieve of claim 1, wherein said third peak has an intensity above background of $Imax_B$, and intersects a fourth peak with a maximum at 23.2 (± 0.20) degrees two-theta, to form a composite peak exhibiting an inflection point at the intersection of the third and fourth peaks.

~~5~~4. The molecular sieve of any preceding claim, wherein the $Imin_A/Imax_A$ ratio is at least 0.40.

~~6. The molecular sieve of any preceding claim, wherein the molecular sieve has the framework structure of ZSM-5.~~

~~7. A molecular sieve having the framework structure of ZSM-5, said molecular sieve comprising crystals having an external surface area in excess of 100 m^2/g as determined by the t-plot method for nitrogen physisorption, and an X-ray diffraction pattern having a composite peak with a maximum at 24.0 (± 0.30) degrees two-theta, which has an intensity above background of $Imax_B$ and which intersects a composite~~

~~peak with a maximum at 23.2 (± 0.20) degrees two-theta, to form a local minimum, which has an intensity above background of Iminβ, such that the Iminβ/Imaxβ ratio is > 0.90.~~

~~8~~5. The molecular sieve of any preceding claim, said molecular sieve comprising crystals having an external surface area (as determined by the t-plot method for nitrogen physisorption) in excess of 200 m^2/g.

~~9~~6. A molecular sieve having the framework structure of ZSM-5, said molecular sieve comprising crystals having an external surface area in excess of 200 m^2/g (as determined by the t-plot method for nitrogen physisorption), and an X-ray diffraction pattern with a single diffuse composite feature in the two-theta range from 21.5 to 26°.

~~10~~7. The molecular sieve of any preceding claim, said molecular sieve comprising crystals having an external surface area (as determined by the t-plot method for nitrogen physisorption) in excess of 250 m^2/g.

~~11~~8. The molecular sieve of any preceding claim, said molecular sieve comprising crystals having an external surface area (as determined by the t-plot method for nitrogen physisorption) greater than their internal surface area.

~~12~~9. The molecular sieve of any preceding claim, said molecular sieve comprising crystals having a total surface area (as determined by the t-plot method for nitrogen physisorption) in excess of 550 m^2/g.

~~13~~10. The molecular sieve of any preceding claim, wherein said molecular sieve has a composition comprising the molar relationship:

$$X_2O_3:(n)YO_2,$$

wherein n is at least about 20, X is a trivalent element, and Y is a tetravalent element.

~~14~~11. The molecular sieve of claim ~~13~~10, wherein X includes aluminum and Y includes silicon and/or germanium.

~~15~~12. A process for converting a feedstock comprising an organic compound to a conversion product, said process comprising the step of contacting said feedstock at organic compound conversion conditions with a catalyst comprising an active form of the molecular sieve material of any preceding claim, to form said conversion product.