

WHAT IS CLAIMED IS:

1. A process for hydroisomerising a diesel feedstock, the process comprising contacting a diesel feedstock with a hydroisomerisation catalyst,

wherein the diesel feedstock comprises or is a biocomponent feed or a Fischer-Tropsch feed, and the hydroisomerisation catalyst comprises zeolite SSZ-91, optionally wherein diesel feedstock is contacted with the hydroisomerisation catalyst and hydrogen under hydroisomerisation conditions in an isomerization reactor, the hydroisomerisation conditions being: temperature in the range of 390°F to 800°F (199 °C to 427°C); pressure in the range of 15 to 3000 psig (0.10 to 20.68 MPa gauge); feed rate of diesel feedstock to the reactor containing the hydroisomerisation catalyst at a rate in the range from 0.1 to 20 h⁻¹ LHSV; and hydrogen and diesel feedstock fed to the reactor in a ratio from 2,000 to 10,000 standard cubic feet H₂ per barrel diesel feedstock (from about 360 to 1800 m³H₂/m³ feed).

2. A process according to claim 1, wherein the diesel feedstock is upgraded, the process comprising:

contacting the diesel feedstock with the hydroisomerisation catalyst under hydroisomerisation conditions to provide a diesel fuel having a reduced cloud point and a reduced pour point compared to the cloud point and pour point of the diesel feedstock, optionally wherein the diesel fuel exhibits a cloud point at least 10 °C lower than the cloud point of the diesel feedstock and a pour point at least 10 °C lower than the pour point of the diesel feedstock, or a cloud point at least 20 °C lower than the cloud point of the diesel feedstock and a pour point at least 20 °C lower than the pour point of the diesel feedstock, or a cloud point at least 30 °C lower than the cloud point of the diesel feedstock and a pour point at least 30 °C lower than the pour point of the diesel feedstock.

3. A process according to claim 1, wherein the hydroisomerisation catalyst comprises a Group 8-10 metal.

4. A process according to claim 1, wherein the zeolite SSZ-91 has, in its calcined form, an X-ray diffraction pattern substantially as shown in the following Table:

2-Theta ^(a)	d-spacing (nm)	Relative Intensity ^(b)
7.67	1.152	M
8.81	1.003	W
12.61	0.701	W
15.30	0.579	W
21.25	0.418	VS
23.02	0.386	VS
24.91	0.357	W
26.63	0.334	W
29.20	0.306	W
31.51	0.284	W

^(a) ± 0.20

^(b) wherein powder XRD patterns provided are based on a relative intensity scale in which the strongest line in the X-ray pattern is assigned a value of 100: W = weak (> 0 to ≤ 20); M = medium (> 20 to ≤ 40); S = strong (> 40 to ≤ 60); VS = very strong (> 60 to ≤ 100).

5. A process according to claim 1, wherein the hydroisomerisation catalyst comprises zeolite SSZ-91 having a silicon oxide to aluminum oxide ratio of 70 to 160, or 80 to 160, or 80 to 140, or 100 to 160.
6. A process according to claim 1, wherein the hydroisomerisation catalyst comprises: (i) zeolite SSZ-91 having at least about 80% polytype 6 of the total ZSM-48-type material present in the zeolite SSZ-91, or at least about 90% polytype 6 of the total ZSM-48-type material present in the zeolite SSZ-91; or (ii) zeolite SSZ-91 and the zeolite SSZ-91 comprises 0.1 to 4.0 wt.% EUO-type molecular sieve phase; or (iii) zeolite SSZ-91 comprising 0.1 to 4.0 wt.% EU-1; or (iv) zeolite SSZ-91 having a morphology characterized as polycrystalline aggregates comprising crystallites collectively having an average aspect ratio of 1 to 4; or (v) zeolite SSZ 91 having: a silicon oxide to aluminum oxide ratio of 70 to 160; a morphology characterized as polycrystalline aggregates comprising crystallites collectively having an average aspect ratio in the range of 1 to 4; at least about 80% polytype 6 of the total ZSM-48-type material present in the zeolite SSZ-91; and 0.1 to 4.0 wt.% EUOtypemolecular sieve phase.
7. A process according to claim 1, wherein the hydroisomerisation catalyst comprises from 5 to 95 wt. % zeolite SSZ-91, and from 0.05 to 2.0 wt. % of a metal modifier.
8. A process according to claim 1, wherein the hydroisomerisation catalyst is a layered catalyst, optionally wherein the hydroisomerisation catalyst comprises a first layer comprising a first hydroisomerisation catalyst and a second layer comprising a second hydroisomerisation catalyst, the first hydroisomerisation catalyst situated in a first hydroisomerisation zone and the second hydroisomerisation catalyst situated in a second hydroisomerisation zone.
9. A process according to claim 8, wherein: (i) the hydroisomerisation catalyst comprises at least one layer comprising zeolite SSZ-91; (ii) wherein the layered catalyst comprising a first layer comprising a first hydroisomerisation catalyst and a second layer comprising a second hydroisomerisation catalyst, wherein the first or second hydroisomerisation catalyst comprises zeolite SSZ-91 and the first and second hydroisomerisation catalysts are mutually exclusive, optionally wherein wherein the first and second hydroisomerisation catalyst comprise zeolite SSZ-91 and a Group 8-10 metal.
10. A process according to claim 1, wherein the diesel feedstock comprises or is a Fischer-Tropsch feed and the Fischer-Tropsch feed has a 90% distillation temperature of less than about 750 °F (about 399°C), for example less than about 700 °F (about 371°C).
11. A process according to claim 1, wherein the diesel feedstock comprises or is a biocomponent feed selected from vegetable oils and animal fats which comprise triglycerides and free fatty acids, for

example wherein the biocomponent feed is selected from canola oil, corn oil, soy oils, castor oil, camelina oil, palm oil and combinations thereof.

12. A process according to claim 1, further comprising contacting the diesel feedstock with a hydrotreating catalyst under hydrotreating conditions prior to contacting the diesel feedstock with the hydroisomerisation catalyst, optionally the the hydrotreating conditions being: temperature in the range of 390 °F to 800 °F (199 °C to 427 °C); pressure in the range of 15 to 3000 psig (0.10 to 20.68 MPa gauge); feed rate of diesel feedstock to the reactor containing the hydrotreating catalyst at a rate in the range from 0.1 to 20 h⁻¹ LHSV; and hydrogen and diesel feedstock fed to the reactor in a ratio from about 2000 to about 10,000 standard cubic feet H₂ per barrel diesel feedstock (from about 360 to about 1800 m³ H₂/m³ feed) .