WHAT IS CLAIMED IS:

1. A hydroisomerization catalyst, useful to make dewaxed products including base oils having improved cloud and pour points, comprising

a catalyst composition comprising an SSZ-91 molecular sieve and a ZSM-12 molecular sieve; wherein, the ZSM-12 molecular sieve is present in an amount from 1.0 to 15.0 wt.%.

2. The catalyst of claim 1, wherein the SSZ-91 molecular sieve and the ZSM-12 molecular sieve are combined with a matrix material to form a base material, and wherein the catalyst further comprises at least one modifier selected from Groups 6 to 10 and Group 14, and optionally further comprising a Group 2 metal, of the Periodic Table.

3. The catalyst of claim 1, wherein the SSZ-91 molecular sieve comprises ZSM-48 type zeolite material, the molecular sieve having:

at least 70% polytype 6 of the total ZSM-48-type material;

an EUO-type phase in an amount of between 0 and 3.5 percent by weight; and

polycrystalline aggregate morphology comprising crystallites having an average aspect ratio of between 1 and 8.

4. The catalyst of claim 1, wherein the silicon oxide to aluminum oxide mole ratio of the SSZ-91 molecular sieve and/or the ZSM-12 molecular sieve is in the range of 40 to 220 or 50 to 220 or 40 to 200, or 50 to 140.

5. The catalyst of claim 3, wherein the SSZ-91 molecular sieve comprises one of more of:

at least 80%, or 90%, polytype 6 of the total ZSM-48-type material;

between 0.1 and 2 wt.% EU-1;

crystallites having an average aspect ratio of between 1 and 5, or between 1 and 3;

or a combination thereof.

6. The catalyst of claim 2, wherein the modifier content is 0.01-5.0 wt.% or 0.01-2.0 wt.%, or 0.1-2.0 wt.% (total catalyst weight basis).

7. The catalyst of claim 2, wherein the catalyst comprises Pt, or a combination of Pt and Pd, as the modifier in an amount of 0.01-1.0 wt.%, or 0.3-0.8 wt.% Pt or the combination of Pt and Pd, optionally further comprising Mg.

8. The catalyst of claim 2, wherein the matrix material is selected from alumina, silica, ceria, titania, tungsten oxide, zirconia, or a combination thereof.

9. The catalyst of claim 2, wherein the catalyst comprises 0.01 to 5.0 wt.% of the modifier, greater than 0 to 99 wt.% of the matrix material, and 0.1 to 99 wt.% of the SSZ-91 and ZSM-12 molecular sieves.

10. The catalyst of claim 9, wherein the SSZ-91 molecular sieve and the ZSM-12 molecular sieve are present in amounts of 0.1 to 99 wt.% of the SSZ-91 molecular sieve and 1 to 15 wt.% of the ZSM-12 molecular sieve.

11. The catalyst of claim 1, wherein the product is a base oil product, or is used to make a base oil product, having a viscosity index of at least 109 and/or a pour point or a cloud point of no greater than -12°C or -15°C or -20°C.

12. A process for producing a base oil product having reduced base oil pour point and/or cloud point, the process comprising contacting a hydrocarbon feedstock with the hydroisomerization catalyst of claim 1 under hydroisomerization conditions to produce a base oil product.

13. The process of claim 12, wherein the hydrocarbon feedstock comprises gas oil; vacuum gas oil; long residue; vacuum residue; atmospheric distillate; heavy fuel; oil; wax and paraffin; used oil; deasphalted residue or crude; charges resulting from thermal or catalytic conversion processes; shale oil; cycle oil; animal and vegetable derived fats, oils and waxes; petroleum and slack wax; or a combination thereof.

14. The process of claim 12, wherein the base oil pour point and/or the base oil cloud point is reduced using the catalyst of claim 1 as compared with the same process using a catalyst comprising the same SSZ-91 molecular sieve but excluding the ZSM-12 molecular sieve.

15. The process of claim 14, wherein the base oil pour point and/or the base oil cloud point is reduced by at least 1°C or 3°C or 5°C or 10°C using the catalyst of claim 1 as compared with the same process using a catalyst comprising the same SSZ-91 molecular sieve but excluding the ZSM-12 molecular sieve.

16. The process of claim 12, wherein the product is a base oil product, or is used to make a base oil product, having a viscosity index of at least 109 and/or a pour point or a cloud point of no greater than -12°C or -15°C or -20°C.

17. A process for making the hydroisomerization catalyst of claim 1, comprising mixing together the SSZ-91 molecular sieve, the ZSM-12 molecular sieve, any added matrix material and sufficient liquid to form an extrudable paste; extruding the paste to form an extrudate base; impregnating the extrudate base with a metal impregnation solution containing at least one modifier selected from Groups 6 to 10 and Group 14, and optionally further comprising a Group 2 metal, of the Periodic Table, to form a metal

loaded extrudate; and subjecting the metal loaded extrudate to drying and calcination post-treatment conditions.

18. The process of claim 17, wherein

the SSZ-91 molecular sieve, the ZSM-12 molecular sieve, any added matrix material and the liquid are mixed together at 20 to 80°C for 0.5 to 30 min.;

the extrudate is formed at 20 to 80°C and dried at 90-150°C for 0.5-8 hrs;

the extrudate is calcined at 260-649°C (500-1200°F), in the presence of sufficient air flow, for 0.1-10 hours;

the extrudate is impregnated with a modifier by contacting the extrudate with the metal impregnation solution containing at least one modifier for 0.1-10 hrs at a temperature in the range of 20 to 80°C; and

the metal loaded extrudate is dried at 90-150°C for 0.1-10 hrs and calcined at 260-649°C (500-1200°F), in the presence of sufficient air flow, for 0.1-10 hours.