CLAIMS

1. A process for conversion of a feedstock comprising C_{8+} aromatic hydrocarbons to lighter aromatic products, the process comprising:

contacting said feedstock and optionally hydrogen in presence of a catalyst composition under conversion conditions effective to dealkylate and transalkylate said C_{8+} aromatic hydrocarbons to produce said lighter aromatic products comprising benzene, toluene and xylene,

wherein said catalyst composition is treated with a source of sulfur and/or steam and includes:

(i) at least a mordenite zeolite, wherein the mordenite zeolite is synthesized from TEA or MTEA, has a mesopore surface area of greater than 30 m^2/g and comprises agglomerates composed of primary crystallites, and wherein said primary crystallites have an average primary crystal size as measured by TEM of less than 80 nm and an aspect ratio of less than 2,

(ii) 0.001 wt.% to 20.0 wt.% of at least one first metal, said at least one first metal being in Group 6 of the Periodic Table, based on a weight of said catalyst composition, and

(iii) 0.001 wt.% to 20.0 wt.% of at least one second metal, said at least one second metal being in Group 9 or Group 10 of the Periodic Table, based on the weight of said catalyst composition.

2. The process of claim 1, wherein said catalyst composition is treated with said source of sulfur in one or more steps at temperatures in a range from 204ºC (400ºF) to about 480ºC (900ºF).

3. The process of claim 2, wherein said source of sulfur is one or more of hydrogen sulfide, carbon disulfide and alkylsulfides which are selected from the group consisting of methylsulfide, dimethylsulfide, dimethyldisulfide, diethylsulfide and dibutyl sulfide, and mixtures of two or more thereof.

4. The process of claim 1, wherein said mordenite zeolite and/or said catalyst composition is treated with a source of steam.

5. The process of claim 4, wherein said source of steam comprises up to about 100% steam at temperatures in a range of about 260ºC (500ºF) to about 649ºC (1200ºF) and said treatment is in one or more temperature steps.

6. A process for conversion of a feedstock comprising C_{8+} aromatic hydrocarbons to lighter aromatic products comprising:

(a) providing a catalyst composition comprising a mordenite zeolite, wherein the mordenite zeolite is synthesized from TEA or MTEA, has a mesopore surface area of greater than 30 m^2/g and comprises agglomerates composed of primary crystallites, and wherein said primary crystallites have an average primary crystal size as measured by TEM of less than 80 nm and an aspect ratio of less than 2,

(b) contacting said catalyst composition with a source of a first metal or compounds thereof and a source of a second metal or compounds thereof to form a metal-containing catalyst composition,
wherein said first metal is in Group 6 of the Periodic Table,
wherein said second metal is in Group 9 or Group 10 of the Periodic Table,
wherein said metal-containing catalyst composition comprises 0.001 wt.% to 20.0 wt.% of said first metal, and 0.001 wt.% to 20.0 wt.% of said second metal, each weight % based on a weight of the catalyst composition; and

(c) treating said metal-containing catalyst composition with a source of sulfur and/or a source of steam to form a treated catalyst composition,

(d) contacting said feedstock and optionally hydrogen in presence of said treated catalyst composition under conversion conditions effective to dealkylate and transalkylate said C_{8+} aromatic hydrocarbons to produce said lighter aromatic products comprising benzene, toluene and xylene.

7. The process of claim 6, wherein said source of sulfur is one or more of hydrogen sulfide, carbon disulfide and alkylsulfides which are selected from the group consisting of methylsulfide, dimethylsulfide, dimethyldisulfide, diethylsulfide and dibutyl sulfide, and mixtures of two or more thereof.

8. The process of claim 6, wherein said mordenite zeolite and/or said catalyst composition is treated with a source of steam.

9. The process of claim 8, wherein said mordenite zeolite and/or said catalyst composition is treated in one or more steps with said source of steam which comprises up to about 100% steam at temperatures in a range of about 260ºC (500ºF) to about 649ºC (1200ºF).

10. The process of claim 1, wherein said at least one first metal in Group 6 is molybdenum or tungsten or a mixture thereof.

11. The process of claim 1, wherein said at least one second metal in Group 9 is cobalt.

12. The process of claim 1, wherein said at least one second metal in Group 10 is nickel.

13. The process of claim 1, wherein the catalyst composition comprises 0.005 wt.% to 15.0 wt.% of the at least one first metal of Group 6, said at least one first metal being molybdenum or tungsten, and 0.001 wt.% to 15.0 wt% of the at least one second metal of Group 9 or Group 10, said at least one second metal being cobalt or nickel.

14. The process of claim 1, wherein the mordenite zeolite has a constraint index of less than 12.

15. The process of claim 1, wherein said C_{8+} aromatic hydrocarbons comprises aromatic compounds having a boiling point in a range of 135°C to 230°C at atmospheric pressure.

16. The process of claim 1, wherein said feedstock further comprises benzene, toluene or a mixture thereof.

17. The process of claim 1, wherein said feedstock comprises C_{9+} aromatic hydrocarbons having nine or more carbon atoms.

18. The process of claim 1, wherein said conversion conditions effective to dealkylate and transalkylate said C_{8+} aromatic hydrocarbons, include at least a temperature of 340°C to 515°C, a pressure from 380 kPa (55 psia) to 4240 kPa (615 psia) and a weight hourly space velocity (WHSV) in a range of 1 to 100 hr^{-1} based on a weight of said feedstock.

19. The process of claim 1, wherein said contacting said feedstock under said conversion conditions is conducted in a reactor, said reactor comprising at least one single fixed catalyst bed of said catalyst composition or said reactor comprising at least one fluid bed of said catalyst composition.