CLAIMS

What is claimed is:

1. A process for the isomerization of a paraxylene-depleted aromatic hydrocarbon feedstream comprising ~~at least one of~~ phenol, ~~styrene, and mixtures thereof,~~ wherein said isomerization of a paraxylene-depleted feedstream is conducted in the presence of a catalyst comprising ~~MCM-49 and/or an~~ HZSM-5 ~~catalyst~~, wherein said HZSM-5 ~~catalyst~~ is characterized ~~in embodiments~~ by an average crystal size of <0.1 micron and a SiO_2/Al_2O_3 molar ratio in the range of about 20-100, in a reactor at a temperature of less than 295°C, ~~preferably 260°C or less,~~ and a pressure sufficient to maintain the xylenes in liquid phase to produce an isomerization product.

2. The process of Claim 1, wherein said feedstream is characterized as containing phenol in the amount of 10 ppm or less.

3. The process of Claim 1, wherein said feedstream is characterized as containing phenol in the amount of 5 ppm or less.

4. The process of Claim 1, wherein said feedstream is characterized as containing phenol in the amount of 2 ppm or less.

~~5. The process of any one of Claims 1-4, wherein said feedstream is characterized as containing styrene in the amount of 100 ppm or less.~~

~~6. The process of any one of Claims 1-4, wherein said feedstream is characterized as containing styrene in the amount of 50 ppm or less.~~

~~7. The process of any one of Claims 1-4, wherein said feedstream is characterized as containing styrene in the amount of 20 ppm or less.~~

8.5. The process of any one of Claims 1-7 Claim 1, further characterized in that said process is operated in a continuous mode with a feedstream containing low ppm levels of dissolved H_2 in the range of about 4 to 100 ppm.

9.6. The process of any one of Claims 1-7 Claim 1, further characterized in that said process is operated in a continuous mode with a feedstream containing low ppm levels of dissolved H_2 in the range of about 4 to 20 ppm.

10.7. The process of Claim 1, further characterized in that said process is operated in a cyclic mode with an H_2-free feedstream, and further wherein said catalyst is periodically regenerated by a step including contacting said catalyst with an H_2-containing feedstream., wherein said H_2-free feedstream is characterized as containing less than 4 ppm dissolved H_2 and said H_2-containing feedstream is characterized as containing about 4 or more ppm dissolved H_2.

11. The process of Claim 10, wherein said H_2-free feedstream is characterized as containing less than 4 ppm dissolved H_2 and said H_2-containing feedstream is characterized as containing about 4 or more ppm dissolved H_2.

8. The process of Claim 1, wherein said reactor is at a temperature of 260°C or less.

12.9. The process of any one of the preceding claims Claim 1, including a step of decreasing the amount of phenol and/or styrene upstream of said isomerization.

13.10. A The process for the isomerization of Claim 1, wherein said paraxylene-depleted feedstream is characterized as an aromatic hydrocarbon feedstream consisting essentially of a xylenes wherein the concentration of paraxylene is less than about 22 wt% relative to the total C8 aromatic hydrocarbons in said feedstream., and at least one of phenol and styrene, said process comprising:

(a) treating said feedstream to reduce the amount of at least one of phenol and styrene relative to the amount of paraxylene in said aromatic hydrocarbon feedstream, wherein said treating comprises: (i) contact of said feedstream with a material

~~selective for the reduction of phenol relative to styrene and paraxylene; and/or (ii) contact of said feedstream with a material selective for the reduction of styrene relative to phenol and paraxylene, to produce a first product having a reduced concentration of phenol and/or styrene relative to said feedstream in (a), and then~~

~~(b) isomerizing said first product in the liquid phase in presence of a catalyst comprising MCM-49 and/or HZSM-5, wherein said HZSM-5 catalyst, characterized in embodiments by an average crystal size of <0.1 micron and a SiO_2/Al_2O_3 molar ratio of about 20-100, in a reactor at a temperature of less than 295°C, preferably 260°C or less, and a pressure sufficient to maintain the xylenes in liquid phase, to product a second product having an increased amount of paraxylene relative to said feedstream in (a).~~

~~14. The process of Claim 13, wherein said feedstream in (a) comprises paraxylene from reformate and/or imported paraxylene.~~

~~15. The process of Claim 13 or Claim 14, wherein said first product comprises at least one of phenol and styrene, and wherein the amount of phenol is less than 10 ppm, preferably less than 5 ppm, more preferably less than 2 ppm, and the amount of styrene is less than 100 ppm, preferably less than 50 ppm, more preferably less than 20 ppm.~~

11. The process of Claim 9, wherein said decreasing comprises:

treating a paraxylene-containing feedstream comprising phenol to reduce the amount of at least one of said phenol, wherein said treating comprises:

(i) contact of said paraxylene-containing feedstream with a material selective for the reduction of phenol relative to paraxylene to produce a first product having a reduced concentration of phenol.

12. The process of Claim 11, wherein said paraxylene-containing feedstream comprises paraxylene obtained from reformate, an alkylation reaction, imported paraxylene, and mixtures thereof.