CLAIMS:

What is claimed is:

1. A process for the purification of an aromatic hydrocarbon stream including selective removal of styrene, comprising contact of said aromatic hydrocarbon process stream containing styrene and at least 70 wt% paraxylene, based on the total amount of C8 aromatic species in said process stream, with at least one material selected from MWW molecular sieves, clays, and mixtures thereof, to provide a product stream having lower concentration of styrene than said process stream., and wherein the selective removal of styrene causes less than 5 wt% of paraxylene to be lost to isomerization by said contact,

wherein said contact comprises initially contacting said aromatic hydrocarbon process stream with said at least one material at a temperature of about 100°C to about 180°C to effectively remove styrene until paraxylene lost by isomerization is less than 5 wt% ad subsequently raising said temperature to about 275°C in a step-wise manner while maintaining paraxylene lost by isomerization to less than 5 wt%.

2. The process according to ~~Claim~~ claim 1, wherein said process stream comprises effluent downstream of an alkylation process comprising the reaction of an alkylating agent selected from methanol, DME, and mixtures thereof, with benzene and/or toluene in the presence of a suitable alkylation catalyst under appropriate conditions to provide said process stream.

3. A process according to ~~Claim~~ claim 1, wherein said process includes the production of paraxylene selectively, and comprises:

(i) reacting of toluene and/or benzene with methanol and/or DME in the presence of a suitable catalyst under appropriate conditions to provide an aromatic hydrocarbon process stream comprising paraxylene in higher than equilibrium amounts and styrene;

(ii) contact of said aromatic hydrocarbon process stream with a material selected from MWW molecular sieves, clays, and mixtures thereof, to remove at least a portion of said styrene so as to provide a product stream having lower concentration of styrene than said process stream.

~~4. The process according to Claim 1, wherein the amount of paraxylene in said aromatic hydrocarbon process stream is greater than 24 wt%, based on the total~~

~~amount of C8 aromatic species in said process stream.~~

~~5.~~4. The process according to ~~Claim~~ claim 1, wherein the amount of styrene present after said contact is less than 20 ppm wt, based on the total amount of aromatic hydrocarbon.

~~6.~~5. The process according to ~~Claim~~ claim 1, wherein the amount of styrene present after said contact is less than 10 ppm wt., based on the total amount of aromatic hydrocarbon.

~~7.~~6. ~~A~~ The process according to ~~Claim~~ claim 1, wherein said process stream is subjected to at least one additional process selected from fractionation, crystallization, and adsorptive separations.

~~8.~~7. ~~A~~ The process according to ~~Claim 7~~ claim 6, wherein said additional process comprises a process to remove oxygenate impurities.

~~9.~~8. ~~A~~ The process according to ~~Claim~~ claim 1, wherein said process is in the presence of hydrogen.

~~10.~~9. ~~A~~ The process according to ~~Claim~~ claim 1, wherein said process is in the absence of hydrogen.

~~11.~~10. ~~A~~ The process according to ~~Claim~~ claim 1, wherein said material is selected from MCM-22, MCM-49, and MCM-56 molecular sieves, acid-treated clays, and mixtures thereof.

11. The process according to claim 1, wherein said material comprises MCM-22 molecular sieves and said contact occurs in the temperature range of 100 to 275°C.

12. The process according to claim 1, wherein the production of benzene as a result of said contact is in amounts of 30 ppm wt. or less, based on the total amount of aromatic hydrocarbon.

13. The process according to claim 1, wherein said contact with the at least one material selected from MWW molecular sieves, clays, and mixtures thereof isomerizes paraxylene less than 5 wt%.

14. The process according to claim 1, wherein the amount of paraxylene isomerization by said contact with the at least one material selected from MWW molecular sieves, clays, and mixtures thereof is not detectable, based on gas chromatographic (GC) analysis.

15. The process according to claim 1, including the reaction of an alkylating

agent selected from methanol, DME, and mixtures thereof, with benzene and/or toluene in the presence of a phosphorus-containing ZSM-5 catalyst that has been steamed, to produce said aromatic hydrocarbon process stream.

~~12. An apparatus comprising an alkylation reactor fluidly connected with a purification system comprising at least one apparatus adapted for the removal of styrene by contact of a process stream with a material selective for the removal of styrene from said process stream of paraxylene without significant production of benzene and without significant loss of paraxylene by isomerization, said at least one apparatus adapted for the removal of styrene fluidly connect to and upstream of an apparatus for the selective removal of paraxylene from a process stream.~~

~~13. The apparatus according to Claim 12, wherein said purification system comprises a vessel containing a material selected from MCM-22, MCM-49, and MCM-56 molecular sieves, acid-treated clays, and mixtures thereof.~~

~~14. The apparatus according to Claim 12, further comprising a liquid isomerization unit, a vapor phase isomerization unit, or a combination thereof.~~

~~15. The apparatus according to Claim 12, further characterized by being integrated by fluid connection and/or heat exchange to a system adapted for at least one of the processes selected from: (i) transalkylation of an aromatic species; (ii) disproportionation of an aromatic species; and (iii) disproportionation and transalkylation of an aromatic species; wherein said disproportionation may be selective disproportionation or non-selective disproportionation.~~