CLAIMS:

What is claimed is:

1. A process for producing paraxylene comprising:

(a) separating a feed comprising C8+ aromatics in a first fractionation step into a first stream comprising paraxylene~~,~~ (PX)~~,~~ and metaxylene~~,~~ (MX)~~,~~ and a second stream comprising orthoxylene (OX) and C9+ aromatics;

(b) separating said first stream in a PX recovery unit to recover a PX-rich stream and a PX-depleted stream;

(c) splitting the PX-depleted stream into at least two fractions having identical compositions, a first portion and a second portion, and then passing ~~a~~ the first portion of said PX depleted stream through a vapor phase xylenes isomerization unit to produce a first isomerate stream and ~~a~~ the second portion of said PX-depleted stream through a liquid phase xylenes isomerization unit to produce a second isomerate stream; and

(d) separating said second stream into a stream comprising OX and a stream comprising C9+ aromatics.

2. The process of claim 1, including at least one benzene separation step selected from a benzene separation step between said liquid phase xylenes isomerization and said first fractionation step, and a benzene separation step between the liquid phase isomerization unit and the PX recovery unit.

3. The process of ~~one of claims 1 and 2~~ claim 1, wherein said ~~liquid phase isomerization product~~ second isomerate stream is recycled to one or more of said first fractionation step~~, said benzene separation step (where present)~~ and said PX recovery step.

4. The process of ~~any one of the preceding claims~~ claim 1, wherein said ~~liquid phase isomerization product~~ second isomerate stream is recycled to said first fractionation step.

5. The process of ~~any one of claims 2 and 3~~ claim 2, wherein said ~~liquid phase isomerization product~~ second isomerate stream is recycled to said benzene separation step.

~~6. The process of any one of the preceding claims, wherein said liquid phase isomerization product is recycled to said PX recovery step.~~

~~7. The process of any one of the preceding claims, wherein said PX recovery step includes a crystallization unit.~~

~~8. The process of any one of the preceding claims, wherein said PX recovery step includes selective adsorption.~~

~~9. The process of any one of the preceding claims, further including a step of fractionation of an isomerate recycle stream to remove toluene, if present in said stream.~~

~~10. The process of any one of the preceding claims, wherein said feed comprising C8+ aromatics includes at least one feed selected from the group consisting of a C8+ selective toluene disproportionation product, a C8+ transalkyation product, a C8+ reformate product, and a C8+ toluene disproportionation product.~~

~~11.~~6. ~~In an~~ An apparatus for the production of paraxylene (PX) and orthoxylene (OX) comprising a first fractionation column operating at conditions suitable for the separation of a C8+ aromatics stream into an overheads stream comprising PX and metaxylene (MX) and a bottoms product stream comprising OX and C9+ aromatics, the overheads stream fluidly connected with a PX recovery unit, wherein said PX recovery unit provides a PX-enriched stream and a PX-depleted stream, the improvement comprising dividing a conduit carrying said PX-depleted stream so that the PX-depleted stream is split into at least two fractions having identical compositions, a first portion and a second portion, ~~a~~ the first portion of said PX-depleted stream is passed to a vapor phase isomerization unit and ~~another~~ the second portion of said PX-depleted stream is passed to a liquid phase isomerization unit.

~~12.~~7. The apparatus of claim ~~11~~ 6, wherein said liquid phase isomerization unit is fluidly connected to said first fractionation column and/or to said PX recovery unit so as to provide liquid phase isomerate recycle to said first fractionation column and/or to said PX recovery unit.

~~13.~~8. The apparatus of ~~any one of claims 11-12~~ claim 6, wherein said PX recovery unit is selected from at least one of a crystallizer and an adsorptive separator.

~~14.~~9. The apparatus of ~~any one of claims 11-13~~ claim 6, further including at least one other fractionator upstream of said first fractionator, wherein said at least one other fractionator operates under conditions suitable for removing benzene from a stream comprising xylenes or for removing toluene from a stream comprising xylenes.~~, and optionally wherein both said fractionator for removing benzene and said fractionator for removing toluene are provided upstream of said first fractionator.~~

~~15.~~10. The apparatus of ~~any one of claims 11-14~~ claim 6, further including at least one separation unit downstream of said first fractionation column fluidly connected to said first fractionation column to receive said bottoms product stream, whereby OX is separated from C9+ aromatics, said at least one separation unit selected from a crystallizer, a membrane unit, or a fractionation column.