WHAT IS CLAIMED IS:

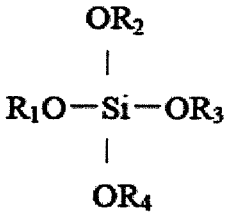
1. A method for preparing p-xylene and co-producing propylene with a high selectivity, comprising the steps of:

a) bringing a raw material containing toluene and methanol and/or dimethyl ether into contact with a catalyst in a reaction system for reaction; returning an ethylene-enriched C_2^- component discharged from the reaction system to the reaction system, and continuing the reaction with the raw material on the catalyst to produce propylene;

b) separating a C_6^+ component discharged from the reaction system to obtain a product p-xylene; and

c) separating a C_3 component discharged from the reaction system to obtain a product propylene,

wherein the catalyst contains a modified zeolite molecular sieve catalyst, the modified zeolite molecular sieve catalyst is obtained from ZSM-5 and/or ZSM-11 zeolite molecular sieves via hydrothermal treatment and modification of a siloxanyl compound, and wherein the conditions for the hydrothermal treatment are treating under an atmosphere of saturated steam at 500-700°C for 3-6 hours, the siloxanyl compound used in the siloxanyl compound modification has a structural formula as shown below:



wherein R_1, R_2, R_3, and R_4 are each independently a $C_{1\text{-}10}$ alkyl group.

2. The method according to claim 1, wherein the reaction system comprises a first reaction zone and a second reaction zone, and the method comprises the steps of:

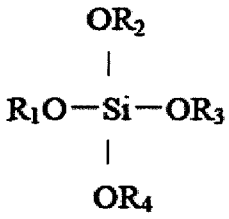
a) passing a raw material containing toluene and methanol and/or dimethyl ether through the first reaction zone to be in contact with a catalyst I for reaction,

and then into the second reaction zone to be in contact with a catalyst II for reaction; returning an ethylene-enriched C_2^- component discharged from the second reaction zone to the second reaction zone, and continuing reaction with methanol and/or dimethyl ether within the second reaction zone on the catalyst II to produce propylene;

b) further separating a C_6^+ component discharged from the second reaction zone to obtain a product p-xylene; and

c) further separating a C_3 component discharged from the second reaction zone to obtain propylene,

wherein the catalyst I and the catalyst II contain the same or different modified zeolite molecular sieve catalyst(s), the modified zeolite molecular sieve catalyst is obtained from ZSM-5 and/or ZSM-11 zeolite molecular sieves via hydrothermal treatment and modification of a siloxanyl compound, and wherein the conditions for the hydrothermal treatment are treating under an atmosphere of saturated steam at 500-700°C for 3-6 hours, the siloxanyl compound used in the siloxanyl compound modification has a structural formula as shown below:



wherein R_1, R_2, R_3, and R_4 are each independently a $C_{1\text{-}10}$ alkyl group.

3. The method according to claim 1, wherein the reaction system comprises a first reaction zone and a second reaction zone, and the method comprises the steps of:

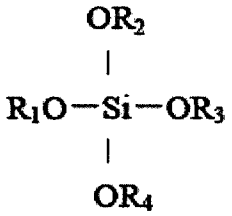
a) passing a raw material containing toluene and methanol and/or dimethyl ether through the first reaction zone to be in contact with a catalyst I for reaction to obtain a resultant A, and then passing through the second reaction zone to be in contact with a catalyst II for reaction to obtain a resultant B; passing an ethylene-enriched C_2^- component in the resultant A and the resultant B into the second reaction zone, and

continuing reaction with methanol and/or dimethyl ether within the second reaction zone on the catalyst II to produce propylene;

b) further separating a C_6^+ component in the resultant A and the resultant B to obtain a product p-xylene; and

c) further separating a C_3 component in the resultant A and the resultant B to obtain a product propylene,

wherein the catalyst I and the catalyst II contain the same or different modified zeolite molecular sieve catalyst(s), the modified zeolite molecular sieve catalyst is obtained from ZSM-5 and/or ZSM-11 zeolite molecular sieves via hydrothermal treatment and modification of a siloxanyl compound, and wherein the conditions for the hydrothermal treatment are treating under an atmosphere of saturated steam at 500-700°C for 3-6 hours, the siloxanyl compound used in the siloxanyl compound modification has a structural formula as shown below:



wherein R_1, R_2, R_3, and R_4 are each independently a $C_{1\text{-}10}$ alkyl group.

4. The method according to claim 1, wherein the reaction system comprises a reactor or a plurality of reactors connected in series and/or in parallel.

5. The method according to claim 2 or 3, wherein the first reaction zone and the second reaction zone are in the same reactor.

6. The method according to claim 2 or 3, wherein the first reaction zone comprises a reactor or a plurality of reactors connected in series and/or in parallel; the second reaction zone comprises a reactor or a plurality of reactors connected in series

and/or in parallel; and the first reaction zone and the second reaction zone are connected in series or in parallel.

7. The method according to claim 4, 5, or 6, wherein the reactor is one or more selected from a fixed bed reactor, a fluidized bed reactor, and a moving bed reactor.

8. The method according to claim 1, 2 or 3, wherein in the modified zeolite molecular sieve catalyst, the amount of Si loaded by siloxanyl compound modification is 1-10wt% based on the total weight of the modified zeolite molecular sieve catalyst.

9. The method according to claim 1, 2 or 3, wherein the siloxanyl compound is tetraethyl orthosilicate.