## Claims

1. A solvothermal synthesis process of SAPO molecular sieves, characterized in that the main steps are as following:

a) an organic amine, an aluminum source, a phosphorus source, a silicon source, and water are mixed in a molar ratio of 6-30 : 1 : 0.5-5 : 0.01-1.0 : 0.1-15, to obtain an initial mixture for preparing the SAPO molecular sieves, wherein the organic amine is one organic amine which functions as both a main solvent and a template agent, and the molar ratio of water to the organic amine is less than 2.0;

b) the initial mixture obtained in the step a) is maintained at 30-60 °C and aged with stirring for not more than 24 hours, to obtain an initial gel;

c) the initial gel obtained in the step b) is crystallized at 150-250 °C for 0.5-15 days,

wherein the initial mixture for preparing the SAPO molecular sieves further comprises an organic alcohol therein, and the molar ratio of the organic amine, the aluminum source, the phosphorus source, the silicon source, the organic alcohol and water in the initial mixture is 6-30 : 1 : 0.5-5 : 0.01-1.0 : 0.01-0.50 : 0.1-15.

~~2. The solvothermal synthesis process of SAPO molecular sieves according to claim 1, characterized in that the initial mixture for preparing the SAPO molecular sieves further comprises an organic alcohol therein.~~

~~3~~2. The solvothermal synthesis process of SAPO molecular sieves according to claim 1~~2~~, characterized in that the organic alcohol is any one of methanol, ethanol, n-propanol, and i-propanol or a mixture thereof.

~~4. The solvothermal synthesis process of SAPO molecular sieves according to claim 2, characterized in that the molar ratio of the organic amine, the aluminum source, the phosphorus source, the silicon source, the organic alcohol and water in the initial mixture is 6-30 : 1 : 0.5-5 : 0.01-1.0 : 0.01-0.50 : 0.1-15.~~

~~5~~3. The solvothermal synthesis process of SAPO molecular sieves according to claim 1~~ or 2~~, characterized in that the aluminum source is any one of aluminium isopropoxide, alumina, aluminum hydroxide, aluminum chloride, and aluminum sulfate or a mixture thereof.

~~6~~4. The solvothermal synthesis process of SAPO-molecular sieves according to claim 1~~ or 2~~, characterized in that the phosphorus source is any one of orthophosphoric acid, metaphosphoric acid, a phosphate, and a phosphite or a mixture thereof.

~~7~~5. The solvothermal synthesis process of SAPO molecular sieves according to claim 1~~ or 2~~, characterized in that the silicon source is any one of silica sol, ethyl orthosilicate, and silica or a mixture thereof.

~~8~~6. The solvothermal synthesis process of SAPO-~~34~~ molecular sieves according to claim 1~~ or 2~~, characterized in that the organic amine is any one of an organic primary, secondary, and tertiary amine~~ or a mixture thereof~~.

~~7~~9. The solvothermal synthesis process of SAPO-~~34~~ molecular sieves according to claim 1~~ or 2~~, characterized in that the organic amine is any one of morpholine, piperidine, isopropylamine, triethylamine, diethylamine, di-n-propylamine, diisopropylamine, hexamethyleneimine, N',N',N,N-tetramethyl-1,6-hexanediamine, and N,N-diisopropylethylamine~~ or a mixture thereof~~.

~~8~~10. The solvothermal synthesis process of SAPO molecular sieves according to claim 1~~ or 2~~, characterized in that the organic amine is any one of diethylamine, triethylamine, morpholine, hexamethyleneimine, and N,N-diisopropylethylamine~~ or a mixture thereof~~.

~~9~~11. The solvothermal synthesis process of SAPO molecular sieves according to claim 1~~ or 2~~, characterized in that the SAPO molecular sieve is any one of SAPO-5, SAPO-34, SAPO-11, SAPO-17, SAPO-18, SAPO-35, SAPO-40, SAPO-41, SAPO-43, SAPO-56, and RHO-SAPO or a mixture thereof.

1012. The solvothermal synthesis process of SAPO molecular sieves according to claim 1 ~~or 2~~, characterized in that the molar ratio of the organic amine to water is 0.51-300.

1113. The solvothermal synthesis process of SAPO molecular sieves according to claim 1 ~~or 2~~, characterized in that the molar ratio of the organic amine to water is 1.5-300.

1214. The solvothermal synthesis process of SAPO molecular sieves according to claim 1 ~~or 2~~, characterized in that the molar ratio of the organic amine to water is 3.0-300.

1315. The solvothermal synthesis process of SAPO molecular sieves according to claim 1 ~~or 2~~, characterized in that the aging time in the step b) is 0.5-15 h.

1416. The solvothermal synthesis process of SAPO molecular sieves according to claim 1 ~~or 2~~, characterized in that the crystallization time in the step c) is 1 to 7 days.

1517. The solvothermal synthesis process of SAPO molecular sieves according to claim 1 ~~or 2~~, characterized in that the process further comprises a step of separating, washing, and drying the crystallized product of step c).

~~18. Catalysts for acid-catalyzed reactions, which are synthesized by the solvothermal synthesis process of SAPO molecular sieves according to claim 1 or 2, and are calcined at 400 - 700 °C in air.~~

~~19. Catalysts for conversion reactions of oxygen-containing compounds to olefins, which are synthesized by the solvothermal synthesis process of SAPO molecular sieves according to claim 1 or 2, and are calcined at 400 - 700 °C in air.~~