Claims

1. A method for preparing methyl acetate, in which a feed gas containing an organic amine, dimethyl ether, carbon monoxide and optional hydrogen gas goes through a reaction region loaded with a H-type mordenite catalyst, to produce methyl acetate at a reaction temperature range from 150°C to 320°C, a reaction pressure range from 0.1MPa to 8MPa and a gas hourly space velocity range from $500h^{-1}$ to $10000h^{-1}$;

wherein said H-type mordenite catalyst is a H-type mordenite catalyst with adsorption of an organic amine;

in said feed gas, the molar ratio range of carbon monoxide to dimethyl ether is from 1:1 to 45:1, and the molar ratio range of the organic amine to dimethyl ether is from 0.00001:1 to 0.2:1, and the molar ratio range of hydrogen gas to dimethyl ether is from 0:1 to 20:1;

said reaction region contains one reactor or reactors which are connected in series or in parallel;

said organic amine is at least one selected from pyridines amines, aromatic amines or alicyclic amines.

2. A method for preparing methyl acetate according to claim 1, wherein in said feed gas, the molar ratio range of the organic amine to dimethyl ether is from 0.0001:1 to 0.01:1.

3. A method for preparing methyl acetate according to claim 1, wherein said H-type mordenite catalyst with adsorption of an organic amine is prepared by the steps as follows:

the H-type mordenite is loaded in a reactor, and then at an adsorption temperature range from 90°C to 420°C or at a preferable adsorption temperature range from 160°C to 320°C, a mixture gas is introduced into the reactor, which contains the organic amine and at least one selected from carbon monoxide, hydrogen gas, air, nitrogen gas, helium gas or argon gas; after the saturated adsorption of the organic amine, the reactor is purged by at least one selected from carbon monoxide, hydrogen gas, air, nitrogen gas, helium gas or argon gas for a time range from 0.5 hour to 6 hours at the adsorption temperature, to obtain said H-type mordenite catalyst with adsorption of the organic amine.

4. A method for preparing methyl acetate according to claim 1, wherein the atom ratio of silicon to aluminum in said H-type mordenite catalyst is at a range from 4:1 to 60:1.

5. A method for preparing methyl acetate according to claim 1, wherein said pyridines amine is at least one selected from pyridine or the substituted pyridines; said aromatic amine is at least one selected from phenylamine or the substituted phenylamines; said alicyclic amine is at least one selected from the alicyclic amines with the number of ring members ranging from 5 to 8 or the substituted alicyclic amines with the number of ring members ranging from 5 to 8.

6. A method for preparing methyl acetate according to claim 5, wherein said substituted pyridines are the compounds which one, two or three of five H atoms in the pyridine ring is respectively substituted by the substituent group selected from F, Cl, Br, I, CH_3, CF_3, CH_3CH_2 or NO_2; said substituted phenylamines are the compounds which one, two, three, four, five, six or seven of seven H atoms composed of five H atoms in the benzene ring and two atoms in the amine group is respectively substituted by the substituent group selected from F, Cl, Br, I, CH_3, CF_3 or CH_3CH_2; said substituted cyclohexylamines are the compounds which at least one of thirteen H atoms in the cyclohexylamine is respectively substituted by the substituent group selected from F, Cl, Br, I, CH_3, CF_3, CH_3CH_2 or NO_2;

said substituted piperidines are the compounds which at least one of eleven H atoms in the piperidine is respectively substituted by the substituent group selected from F, Cl, Br, I, CH_3, CF_3, CH_3CH_2 or NO_2.

7. A method for preparing methyl acetate according to claim 1, wherein the organic amine adsorbed in said catalyst is same as the organic amine in said feed gas, or the organic amine adsorbed in said catalyst is different from the organic amine in said feed gas.

8. A method for preparing methyl acetate according to claim 1, wherein the organic amine adsorbed in said catalyst is at least one selected from pyridine, 2-mehtylpyridine, phenylamine, 4-methylaniline, cyclohexylamine or piperidine; the organic amine in said feed gas is at least one selected from pyridine, 2-methylpyridine, phenylamine, 4-methylaniline, cyclohexylamine or piperidine.

9. A method for preparing methyl acetate according to claim 1, wherein the organic amine in said feed gas is the fresh organic amine or the recycled organic amine obtained in the process of the product separation.

10. A method for preparing methyl acetate according to claim 1, wherein said reactor is a continuous flow fixed bed reactor, a moving bed reactor or a fluid bed reactor.

11. A method for preparing methyl acetate according to claim 5, wherein alicyclic amine is at least one selected from cyclohexylamine, piperidine, the substituted cyclohexylamines or the substituted piperidines.