Claims

1. A method for the selective dealumination of the aluminum within the 12-membered ring channels of a zeolite of structure type MOR, which method comprises the steps:

(i) loading ~~a~~the MOR zeolite in the hydrogen or aluminum form with a univalent metal to obtain a metal loaded zeolite, wherein the MOR zeolite is loaded with the univalent metal to exchange all or substantially all of the Brønsted acid sites in the 8-membered ring channels but not the Brønsted acid sites in the 12-membered ring channels;

(ii) treating the metal loaded zeolite with steam at a temperature of at least 400 °C to obtain a metal loaded dealuminated zeolite.

2. A method according to claim 1 wherein the univalent metal is a metal belonging to Group 1 or Group 11 of the Periodic Table of Elements.

3. A method according to claim 2 wherein the univalent metal is sodium or silver.

~~4. A method according to any one of claims 1 to 3 wherein the MOR zeolite is loaded with the univalent metal to exchange all or substantially all of the Brønsted acid sites in the 8-membered ring channels but not the Brønsted acid sites in the 12-membered ring channels.~~

4~~5~~. A method according to ~~any one of~~ claims 2 ~~to 4~~ wherein the MOR zeolite is mordenite and mordenite is loaded with the univalent metal in an amount equivalent to 50 mol% of the total amount of aluminium present in the mordenite.

5~~6~~. A method according to ~~any one of~~ claims 1 ~~to 5~~ wherein prior to step (ii) the zeolite is calcined.

6~~7~~. A method according to ~~any one of~~ claims 1 ~~to 6~~ wherein the metal loaded zeolite

is treated with steam to effect the removal of all or substantially all of the aluminium from its 12-membered ring channels.

78. A method according to ~~any one of~~ claims ~~1 to 7~~ wherein the metal loaded dealuminated MOR zeolite of step (ii) is converted to the hydrogen form of the dealuminated MOR zeolite.

89. A method according to claim 78 wherein the metal loaded dealuminated zeolite is converted to the hydrogen form by converting the dealuminated zeolite into its ammonium form and then calcining the ammonium form of the dealuminated zeolite.

910. A method according to claim 78 wherein the metal loaded dealuminated zeolite is converted to the hydrogen form by treatment with a mineral acid at a pH of below 7.

1011. A method according to ~~any one of~~ claims ~~78 to 10~~ wherein the hydrogen form of the dealuminated zeolite is ion-exchanged or otherwise loaded with one or more metals selected from copper, silver, gold, nickel, iridium, rhodium, platinum, palladium and cobalt.

1112. A method according to claim ~~1~~12 wherein the metal loaded dealuminated zeolite is calcined.

1213. A MOR zeolite having improved carbonylation catalytic activity, said MOR zeolite obtained by:

(i) loading a MOR zeolite in the hydrogen or ammonium form with a univalent metal to obtain a metal loaded zeolite, wherein the MOR zeolite is loaded with the univalent metal to exchange all or substantially all of the Brønsted acid sites in the 8-membered ring channels but not the Brønsted acid sites in the 12-membered ring channels;

(ii) treating the metal loaded zeolite with steam at a temperature of at least 400 °C to selectively dealuminate the aluminum within the 12-membered ring channels of the MOR zeolite to obtain a metal loaded dealuminated zeolite; and

(iii) converting the metal loaded dealuminated zeolite to the hydrogen form of the dealuminated zeolite.

13~~14~~. A process for the production of at least one of acetic acid and methyl acetate by the carbonylation of at least one carbonylatable reactant selected from methanol, dimethyl ether and dimethyl carbonate with carbon monoxide in the presence of a zeolite catalyst which zeolite is a dealuminated zeolite of structure type MOR and obtained by the method of ~~any one of~~ claims 7~~8 to 13~~.

14~~15~~. A process according to claim 13~~14~~ wherein the carbonylation produces a product stream comprising methyl acetate and the methyl acetate is recovered and hydrolysed to acetic acid or the product stream is hydrolysed and acetic acid recovered therefrom.