CLAIMS

1. A method of producing an ethylenically unsaturated carboxylic acid or ester, preferably an α, ß ethylenically unsaturated carboxylic acid or ester, comprising the steps of contacting formaldehyde or a suitable source thereof with a carboxylic acid or ester in the presence of a catalyst and optionally in the presence of an alcohol, wherein the catalyst comprises a nitrided metal oxide having at least two types of metal cations, M^1 and M^2, wherein M^1 is selected from the metals of group 2, 3, 4, 13 (called also IIIA) or 14 (called also IVA) of the periodic table and M^2 is selected from the metals of groups 5 or 15 (called also VA) of the periodic table.

2. A method according to claim 1, wherein the nitrided metal oxide consists of two to four metal cations, and oxygen and nitrogen anions.

3. A method according to any of claims 1-~~3~~2, wherein the M^1 type of metal is selected from one or more metals in the list consisting of:- Be, Mg, Ca, Sr, Ba, Ra, B, Al, Ga, In, Tl, Sc, Y, La, Ac, Si, Ge, Sn, Pb, Ti, Zr, Hf and Rf.

4. A method according to any of claims 1-~~4~~3, wherein the M^2 type of metal is selected from one or more metals in the list consisting of:- P(5+), Nb(5+), As (5+) Sb(5+) and Ta(5+).

5. A method according to any of claims 1-~~5~~4, wherein the nitrided metal oxide is selected from the list

consisting of:- AlPON; ZrPON; SnPON; ZrNbON; GaSbON; and GaAlPON, either unsupported or supported on a suitable support, for example, alumina, silica, silicon nitride, colloidal silica, titania or aluminium phosphate.

6. A method according to any of claims 1-~~6~~5, wherein a further metal or metal cation of the type M^3 is also present in the nitrided mixed metal oxide wherein M^3 metals include metals from group I of the periodic table.

7. A method according to any of claims 1-6, wherein the nitrided metal oxide formula is: $M^1_nM^2_mM^3_qO_pN_s$ wherein M^1 is a cation, preferably, a 3+ cation and M^2 is a cation, preferably, a 5+ cation, n, m, p and s ~~may be~~are a positive integer or decimal number and q ~~may~~ is ~~be~~ a positive integer or decimal number or zero.

8. A method according to any of claims 1-7, wherein the carboxylic acid or ester reactant is of formula R^3-CH_2-$COOR^4$ wherein R^4 is either hydrogen or an alkyl group and R^3 is either hydrogen, an alkyl or aryl group.

9. A method according to any of claims 1-8, wherein the ethylenically unsaturated acid or ester produced by the process of the invention is selected from methacrylic acid, acrylic acid, methyl methacrylate, ethyl acrylate or butyl acrylate.

10. A catalyst system for the reaction of formaldehyde or a suitable source thereof with a carboxylic acid

or ester, optionally in the presence of an alcohol, to produce an ethylenically unsaturated carboxylic acid or ester, preferably α, ß ethylenically unsaturated carboxylic acids or esters, wherein the catalyst comprises a nitrided metal oxide having at least two types of metal cations, M^1 and M^2, wherein M^1 is selected from at least two metals of group 2, 3, 4, 13 (called also IIIA), 14 (called also IVA) of the periodic table and M^2 is selected from at least one metal of group 5 or at least one metal of group 15 (called also VA) in the 4^{th} to 6^{th} periods of the periodic table.

11. A catalyst system according to claim 10, wherein the nitrided metal oxide consists of ~~two~~ up to four metal cations, and oxygen and nitrogen anions.

12. A catalyst system according to claim 10 or 11 wherein the nitrided metal oxide formula is: $M^1_xM^2_yO_nN_z$ wherein z is the average number of nitrogen atoms and wherein x, y, n and z ~~may each be~~are a positive decimal number or integer.

13. A catalyst system according to any of claims 10-12, wherein the M^1 type of metal is selected from ~~one~~ two or more metals in the list consisting of:- Be, Mg, Ca, Sr, Ba, Ra, B, Al, Ga, In, Tl, Sc, Y, La, Ac, Si, Ge, Sn, Pb, Ti, Zr, Hf and Rf.

14. A catalyst system according to any of claims 10-13, wherein the M^2 type of metal is selected from one or more metals in the list consisting of:- Nb(5+), As (5+) Sb(5+) and Ta(5+).

~~15. A catalyst system according to any of claims 10-14, wherein the nitrided metal oxide is selected from the list consisting of:- AlPON; ZrPON; SnPON; ZrNbON; GaSbON; and GaAlPON, either unsupported or supported on a suitable support, for example, alumina, silica, silicon nitride, colloidal silica, titania or aluminium phosphate.~~

~~16~~15. A catalyst system according to any of claims 10-~~15~~14, wherein a further metal or metal cation of the type M^3 is also present in the nitrided mixed metal oxide and wherein M^3 metals include metals from group I of the periodic table.