



and further comprising at least one metal selected from the group consisting of Group IB, Group IVA, Group VB, Group VIIB, Group VIII, and mixtures thereof. An example of this catalyst is zirconia, modified with tungstate, and iron. This method may be used for reducing emissions of nitrogen oxides from waste gases, including industrial exhaust gases and automobile exhaust gases. In a particular embodiment, nitrogen oxides in waste gases may be reacted with ammonia before the waste gases are discharged to the atmosphere.

**5552129**

### **CATALYTIC SYSTEM FOR THE REDUCTION OF NITROGEN OXIDES**

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There is presented a specially prepared catalyst and a process for the treatment of exhaust gas with that catalyst, which is useful for the selective catalytic reduction of NO<sub>x</sub> contained in the exhaust gas. An embodiment of the process of this invention comprises a catalytic stage to selectively catalytically reduce NO<sub>x</sub> over a catalyst composition comprising a metal and an in-situ crystallized zeolite, ZSM-5. The catalyst of this invention may be formed into a desired shape, e.g., by extrusion, and finished in a humidified atmosphere after forming.

**5559069**

### **CATALYSTS FOR HALOGENATED HYDROCARBON PROCESSING, THEIR PRECURSORS AND THEIR PREPARATION AND USE**

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A process is disclosed for changing the fluorine content of halogenated hydrocarbons containing from 1 to 6 carbon atoms, in the presence of a multiphase catalyst, which is characterized by preparing certain single phase solid catalyst precursors containing two metal components (e.g., a divalent component of Mn, Co, Zn, Mg and/or Cd and a trivalent component of Al, Ga, Cr and/or V) which have structures that collapse at about 600°C or less; and producing said catalyst by heating the precursor to produce a multiphase composition wherein a phase containing one of the metal components is homogeneously dispersed with a phase containing the other metal component, and at least when the precursor contains no fluoride, contacting said multiphase composition with a vaporizable fluorine-containing fluorination compound at a temperature of from about 200°C to 450°C. Also disclosed are single phase fluoride compositions having the formula  $MM'F_5(H_2O)_2$  wherein M is a divalent component selected from Mn, Co, Zn, Mg and/or Cd and M' is a trivalent component selected from Al, Ga, Cr and/or V (provided that Cr is not more than about 10 atom percent of M'); preparation of certain homogeneously dispersed multiphase catalyst compositions containing fluorides of those divalent and trivalent metal components; and certain homogeneously dispersed multiphase catalyst compositions containing fluorides of those divalent and trivalent metal components (provided that when Co is used another of said divalent elements is also used).

**5559071**

### **CATALYST, PROCESS FOR THE PRODUCTION THEREOF, AND USE THEREOF FOR THE PREPARATION OF VINYL ACETATE**

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