Cl 252

Published June 22, 1943

Serial No. 265,605

ALIEN PROPERTY CUSTODIAN

PROCESS FOR THE PREPARATION OF CATALYSTS FOR HYDROGENATION

Joseph Zeltner, Paris, France; vested in the Alien Property Custodian

No Drawing. Application filed April 1, 1939

It is well known that catalysts for the hydrogenation of certain organic compounds can be prepared if an alloy of certain metals is decomposed by the action of neutral or alkaline substances attacking only one of the alloyed metals.

The present invention has for its object a process, for the preparation of catalysts for hydrogenation, and is particularly applicable to nickel catalysts. The said invention consists, for example, in treating an alloy of nickel and a more electropositive element, such as magnesium or calcium, with a weak or dilute acid, used in such proportions as to correspond at least to all the magnesium or other electropositive metals contained in the alloy. The treatment can be carried out in the hot or in the cold. The alloy can be subjected to the treatment in the form of lumps, shavings, etc., but it is preferable to treat it in the powdered form.

All acids which do not attack the nickel but which are capable of dissolving the more electropositive metals, may be used. The inventor has achieved particularly favourable results when using acetic acid to attack a magnesium-nickel alloy.

The inventor has moreover discovered that the action of the said weak or dilute acid is facilitated if the alloy is previously treated with boiling water or a neutral or saline solution.

By way of example, a useful nickel catalyst, giving excellent results in the hydrogenation of many unsaturated organic compounds, may be prepared as follows. An alloy containing 55% of nickel and 45% of magnesium is finely powdered and then treated with boiling water or a solution of the salt of a strongly electro-positive metal, provided the salt exhibits no tendency to poison the catalyst subsequently. The alloy is next treated with a 20% solution of acetic acid in water. The catalyst and the solution are mixed in small portions until there is no more evolution of hydrogen. The solution of magnesium acetate so obtained is decanted, and the undissolved nickel is washed with water. It can then be kept under suitable conditions for long periods without its catalytic properties being impaired. For example alcohol forms an excellent medium for its conservation.

A nickel catalyst so prepared is extremely active.

In the preparation of nickel catalysts according to the said invention, the use of acetic acid as described in the above example may be replaced by any other weak or dilute acid capable of dissolving the magnesium or other electro-positive metal, but having only a slight action on the nickel constituent, or none at all. Thus propionic acid forms an excellent substitute for acetic acid in the case of nickel-magnesium alloys.

Similarly the nickel in the alloy may be replaced by any other metal which is attacked only slightly or not at all by the weak or dilute acid employed, provided always that the metal in question so treated forms a useful catalyst for hydrogenation.

Similarly, the process is equally applicable to a mixture of metals, either electropositive and capable of being attacked by a weak or dilute acid, or resisting attack by the said acids and capable of serving as catalysts. Thus, instead of magnesium or calcium, one can employ a mixture of these two metals, or indeed any alkali or alkaline earth-metals, either alone or together. One can also prepare, according to the said invention, by attacking with weak or dilute acids an alloy of the metals to serve as catalysts with more electropositive metals, a mixture of catalysts, such as a catalytic mixture of nickel and iron.

The said invention also covers, as new industrial products, all active catalysts for hydrogenation prepared as hereinbefore described.

JOSEPH ZELTNER.