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ALIEN PROPERTY CUSTODIAN

PROCESS FOR PRODUCING OF CATALYSTS

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The present invention relates to the production of a new and useful catalyst especially suitable in the field of generally spoken heterogene catalysts, e. g. in synthetic processes, oxidation reactions, reduction-processes, splitting-off as well as hydrogenation or dehydrogenation. The new catalysts are especially suitable for the production of mixed catalysts which contain metals or metal oxides, or metal salts.

The use of metals as catalysts is known. These may be produced by converting the salts into the oxides or by reducing the oxides, produced in any way. The obtained finely divided metals may be brought up on carriers. Catalysts brought up on sized carriers are especially suitable in the continuous working. Tube furnaces may be charged with the granular catalysts and the materials which are to be reacted are passed over.

It is known to obtain granulated catalysts in such manner that from an alloy of a catalysing metal, e. g. for the hydrogenation, and another metal, the latter is wholly or partially eliminated. To carry out hydrogenation reaction, nickel-aluminium alloy in various compositions are particularly suited, whereby the aluminium is eliminated by caustic soda or soda solution.

Hereby it is useful to granulate the alloy in parts of the desired size before the alkaline treatment. In this manner the catalyst itself serves as a carrier. Only the surface of the catalyst is active and not the inner parts of the same consisting of expensive material.

The present invention relates to the production of a highly activated catalyst in granular form which is suitable in continuous working, whereby in the contrary to the known catalysts not only the surface, but also the whole catalyst is in operation.

This is advantageous in view of the fine division and the complete utilization of the whole catalyst material. For this purpose the catalytic substance is deposited on e. g. a porous carrier in finely divided form, but not as an impermeable coating. The catalysts have the advantage that their outside and inside are likewise active in such manner that by the reaction, e. g. the hydrogenation, the entrance respectively the throughput through the whole catalyst body is possible. The contact substance, such as metal, metal salts, alloy etc. may be sprayed on the carrier. The granular carrier material may also be introduced or stirred in the melted or liquid contact substance.

A granular carrier material of the desired size is given into a shaking device or in a roll provided with a sieve, which is rotated, or similar apparatus. The meshes of this sieve have a size which prevents the carrier from falling out. The roll on the shaking device is

moved. The contact mass is then sprayed on the carrier.

In accordance to the invention e. g. a nickel-aluminium-alloy may be sprayed up.

5 By use of a suitable degree of rotation of the sieve roll it is possible to coat the carrier with a complete thin film of alloy. Various substances may be used as carrier, e. g. sized clay, pumic stone, silicagel, asbestos, activated carbon; metals such as iron, nickel, aluminium, whereby the latter are preferably used in the form of Prym-rings.

10 The contact carriers such prepared is treated with diluted caustic soda to eliminate the wholly or partially aluminium. Thereupon the carrier is washed by hot water. The activated contact is finally preserved in alcohol until use. In contact with the air the catalyst undergoes oxidation under spontaneous glowing.

15 The contact in accordance to the present invention may be also produced by spraying the contact substance on porous carrier plates or in any other way of coating, whereby a porous layer or coating of alloy arises. In every case the treated carriers are freed from one constituent e. g. alumina by treatment with suitable solvents, e. g. caustic soda, in order to obtain porous surfaces. Such plates may be sized to a desired degree. The preparation, especially 20 the reduction of the proper contact matter may be performed before or after its spraying onto the carrier. The preparation of e. g. iron oxide containing catalysts may further be performed by spraying molten iron onto carriers, whereby oxidation of the iron occurs. The spraying or impregnation may be done e. g. in hydrogen or in any reducing gases material. On the other hand the contact may first be heated in any reducing gas and afterwards treated with suitable 25 solvents in order to eliminate one of the constituents e. g. aluminium. Oxides or salts of catalytic active metals may also put on the carrier by working in the heat. It happens some time that the solvents like sodium or potassium 30 hydroxide can not be wholly eliminated from the catalysts even after several extracting with boiling distilled water. Traces of said solvents respectively alkaline matter are however in most cases not at all undesired. In the contrary e. g. 35 in hydrogenation processes the content of little quantities of alkaline matter exert a promoting effect.

40 When the catalyst according to the present invention lessens in activity it may be reactivated in known manner. To this end, however, it is preferable to treat the catalyst with suitable solvents as stated above and afterwards to heat in any reducing gas. The catalysts may also be reactivated solely by washing out with 45 lye and hot water.

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