**Chemical reactor having a woven wire mesh product as a retaining device for particles**

The present invention relates to a chemical reactor for the heterogeneously catalysed reaction of a fluid, having an improved retaining means for inert particles and/or catalyst particles through which fluid flows. It also relates to a method for carrying out chemical reactions by means of such a reactor and the use of wire mesh knitted fabric in chemical reactors.

The hydrogenation of nitroaromatic compounds to form the corresponding amines in a fixed-bed reactor which is flowed through axially may take place in a multi-stage process under adiabatic reaction conditions. Such hydrogenation processes take place in periodic cycles, wherein production cycles alternate with regeneration cycles, for example in which carbonaceous deposits are removed by being burnt off.

Reactors for such reactions are typically cylindrical in shape and are equipped with a wedge wire screen which acts as a substrate for the fixed-bed catalyst (Heterogeneous Catalysis in Industrial Practice, 2nd Ed. 1996, page 474). These wedge wire screens must bear the weight of the catalyst as well as the additional load produced by the pressure loss via the catalyst fill.

Wedge wire screens as described for example in US 2,915,375 are often used. They consist of V-shaped wires arranged in parallel which are in turn supported and fixed so that openings are produced, of which the width is smaller than the particle size of the material to be supported, said openings widening downwardly so as, if necessary, to carry off downwardly any material infiltrating between the wires and to prevent blocking the wedge wire screen.

Owing to the periodic operation of the reactors, the screen is subjected to thermal stresses, which lead to damage. In particular this is the case if exothermic reactions are carried out under adiabatic conditions, that is to say the reaction heat which is released is absorbed by the reaction gas and therefore extreme jumps in temperature are produced inside the reactor.

# CHEMICAL REACTOR WITH KNITTED WIRE MESH FABRIC AS A HOLDING DEVICE FOR PARTICLES

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