In another aspect, there is provided a process for producing a shaped catalyst body comprising a material of the formula $CuAl_aMn_bZn_cO_d$ and comprising calcium aluminate as binder material in a proportion by weight of 0.5% to 20.0%, based on the shaped catalyst body, comprising the following steps:

a) mixing a metal-containing mixture comprising copper, manganese and at least one element selected from zinc and aluminum with calcium aluminate, a lubricant and water

b) tableting the mixture according to step a) to obtain a tableted shaped body

c) subjecting the tableted shaped bodies to thermal treatment at a temperature between 200 and 800°C for a period between 30 min and 4 h,

where a is between 0 and 2.5, b is between 0.001 and 0.6 and c is between 0 and 2.5, and d is chosen such that the overall charge of the empirical formula is zero.

In another aspect, there is provided a process for hydrogenating carbonyl groups in organic compounds with the shaped catalyst body as described herein or produced by a process as described herein.

Description of the invention

The invention relates to a shaped catalyst body in tablet form, comprising a material of the formula $CuAl_aMn_bZn_cO_d$ and calcium aluminate as binder material.

a is between 0 and 2.5, b is between 0.001 and 0.6, c is between 0 and 2.5, and d is chosen such that the overall charge of the empirical formula is zero. In a particular embodiment, a is between0.8 and 1.2, b is between0.05 and 0.3, c is 0, and d is chosen such that the overall

cement or a mixture of the two materials and shaped to tablets. The catalyst is used for the hydrogenation of organic compounds having carbonyl groups.

Yakerson et al. (Scientific Bases for the Preparation of Heterogeneous Catalysts, Preparation of Catalysts, p. 879 ff.) describes the preparation of cement-containing metal catalysts, for example nickel, copper or zinc catalysts. The corresponding metal hydroxo carbonates are used for this purpose.

The starting compounds in the hydrogenation processes generally include traces of acidic compounds. These are, for example, carboxylic acids present as by-products in esterification reactions. These compounds attack the catalyst under the conditions of the hydrogenation reaction and lead to lowering of mechanical stability and the occasional observation of leaching-out of the catalytically active metals, which are discharged from the reaction reactor with the product stream and have to be separated therefrom. Moreover, there is also a reduction in the catalytic activity of the catalyst with advancing discharge of the catalytically active metals.

Catalysts containing copper and chromium are used for such reactions. These typically have elevated stability to the action of acid. Owing to stricter environmental regulations, the use of chromium catalysts is associated with ever higher demands, and so there is a need to replace the existing CuCr systems with environmentally compatible alternatives that nevertheless have comparable catalytic and physical properties.

It was therefore an object of the present invention to provide a catalyst for hydrogenations of carbonyl groups in organic compounds that features improved mechanical stability and is less prone to the action of acidic compounds.

This object is achieved by the catalyst of the invention.

Summary of the invention

In one aspect, there is provided a shaped catalyst body comprising a material of the formula $CuAl_aMn_bZn_cO_d$ where a is a number between 0 and 2.5, b is a number between 0.001 and 0.6 and c is a number between 0 and 2.5, and d is chosen such that the overall charge of the empirical formula is zero, wherein the shaped catalyst body is in tablet form and contains calcium aluminate as binder material in a proportion by weight of 0.5% to 20.0%, based on the shaped catalyst body.