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Hydrogenation catalyst, a process for its preparation, and the use thereof

Abstract

The invention relates to a hydrogenation catalyst comprising nickel, nickel oxide, magnesium oxide, sodium oxide and a water-insoluble support material, said hydrogenation catalyst containing

from 25 to 50% by weight of nickel (metallic)
from 10 to 35% by weight of nickel oxide
from 4 to 12% by weight of magnesium oxide
from 1 to 5% by weight of sodium oxide
remainder support material,

where the total of nickel and nickel oxide is from 40 to 70% by weight, and having a surface area determined by BET from 80 to 200 m^2/g and a total pore volume determined by Hg porosimetry from 0.35 to 0.6 ml/g, with the total pore volume being made up of

from 30 to 60% by volume having a pore radius of ≤ 40 Å,
from 4 to 10% by volume having a pore radius of > 40 to 300 Å,
from 30 to 60% by volume having a pore radius of > 300 to 5000 Å.

A process for preparing the hydrogenation catalyst is also provided, which process comprises preparing, in a precipitation step, a green catalyst from nickel salt, magnesium salt and sodium carbonate and also a support material, slurrying this green catalyst, after separating off the mother liquor and partial washing, in alkali solution, separating it from the liquid phase, drying and treating the dried green catalyst with hydrogen until from 42 to 83% by weight of the total nickel content is

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present in metallic form.

The hydrogenation catalyst of the invention is particularly suitable for the hydrogenation of propanal, n-butanal and i-butanal at temperatures between 100 and 160°C.

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