Claims

1. A Cu-Al catalyst, characterized in that the catalyst contains zirconium in a proportion by weight of 0.5% to 20.0% based on the total weight of the catalyst after loss on ignition, wherein the catalyst contains Cu in an amount within a range from 20% to 50% by weight, and Al in an amount within a range from 8% to 29% by weight, based on the total weight of the catalyst after loss on ignition.

2. The catalyst as claimed in claim 1, wherein the zirconium is present in a proportion by weight of 5.0% to 20.0%, preferably within a range of 10% to 20% by weight, based on the total weight of the catalyst after loss on ignition.

3. The catalyst as claimed in either of claims 1 or 2, wherein the catalyst contains Cu in an amount within a range from 25% to 40% by weight, and Al in an amount within a range from 15% to 25% by weight, based on the total weight of the catalyst after loss on ignition.

4. The catalyst as claimed in any of claims 1 to 3, wherein the catalyst is present in the form of a shaped body.

5. The catalyst as claimed in claim 4, wherein the shaped catalyst body is present in tablet form.

6. The catalyst as claimed in either of claims 4 or 5, wherein it has a binder content within a range from 2% to 30% by weight, preferably within a range from 2% to 10% by weight, and more preferably within a range from 2% to 5% by weight, based on the total weight of the shaped body after loss on ignition.

7. The catalyst as claimed in claim 6, wherein the binder is calcium aluminate.

8. The catalyst as claimed in claim 7, wherein the proportion of calcium in the shaped body is within a range from 0.14% to 17.02% by weight, preferably within a range from 0.14% to 5.67% by weight, and more preferably within a range from 0.14% to 2.84% by weight, based on the total weight of the shaped body after loss on ignition.

9. The catalyst as claimed in any of claims 4 to 8, wherein the side crush strength is 80 to 500 N, preferably 150 to 250 N, more preferably 170 to 230 N.

10. The catalyst as claimed in any of claims 1 to 9, wherein it has a cubic zirconium dioxide phase and optionally in addition a further ZrO_2 phase selected from orthorhombic and monoclinic zirconium dioxide.

11. The catalyst as claimed in any of claims 1 to 10, wherein the catalyst does not contain manganese in oxidized or metallic form.

12. A process for preparing a catalyst as claimed in any of claims 1 to 11 containing zirconium in a proportion by weight of 0.5% to 20.0%, Cu in an amount within a range from 20% to 50% by weight, and Al in an amount within a range from 8% to 29% by weight, based on the total weight of the catalyst after loss on ignition, said process comprising the following steps:

    a) combining (i) at least one aqueous solution A comprising copper compounds, zirconium compounds, and optionally further transition metal compounds and (ii) at least one aqueous alkaline solution B to form a precipitate, wherein solution A and/or solution B additionally include(s) a dissolved aluminum compound,

    b) separating off the precipitate, optionally washing the precipitate,

    c) drying the precipitate to obtain a dried precipitate,

    d) calcining the dried precipitate from step c) at a temperature of between 200 and 800°C for a period of between 30 min and 4 h.

13. The process as claimed in claim 12, comprising the following step:

    e) shaping the calcined precipitate from step d) to obtain a shaped body.

14. The process as claimed in claim 13, comprising the following step:

    f) subjecting the shaped body to thermal treatment at a temperature of between 200 and 800°C for a period of between 30 min and 4 h.

15. The process as claimed in claim 14, wherein the thermal treatment in step f) takes place at between 400 and 700°C for a period of between 1 h and 3 h.

16. The process as claimed in any of claims 14 or 15, wherein step f) is followed by reduction of the catalyst.

17. A process for hydrogenating carbonyl groups in organic compounds with the catalyst as claimed in any of claims 1 to 11 or prepared by a process as claimed in any of claims 12 to 16.

18. The process as claimed in claim 17, wherein the water content of the reaction stream is 0.1% to 5.0% by weight, preferably 0.2% to 5.0% by weight, more preferably 0.5% to 5.0% by weight, particularly preferably 0.5% to 3.0% by weight.

19. The process as claimed in either of claims 17 or 18, wherein the acid value of the reaction stream is within a range from 0.1 to 3.4 $mg_{KOH}/g_{solution}$, preferably within a range from 0.2 to 1.0 $mg_{KOH}/g_{solution}$.

20. The process as claimed in claim 17 for hydrogenating aldehydes to alcohols.

21. The process as claimed in claim 17 for hydrogenating a fatty acid methyl ester.

22. The process as claimed in claim 17 for hydrogenating ketones to alcohols.