Claims

1. A catalyst for producing dibasic amine by hydrogenation of dibasic nitrile, which comprises:

a) an active component, wherein the active component is Ni and/or an oxide thereof;

b) an auxiliary, preferably, the auxiliary comprises one or more of Mg, Cu, Co, Zn, Zr, Mo and/or oxides thereof, more preferably the auxiliary comprises one or more of Cu, Co, Zr, Mo and/or oxides thereof;

c) a support;

wherein, when said catalyst is in its fully oxidized state, the relative content of α-NiO in the catalyst is less than 2.0 a.u., for example less than or equal to 1.5 a.u., further for example less than or equal to 0.2 a.u..

2. A catalyst, which is characterized in that said catalyst comprises:

a) an active component, wherein the active component is Ni and/or an oxide thereof;

b) an auxiliary, wherein the auxiliary comprises Co or an oxide thereof, preferably, the auxiliary is Co or an oxide thereof;

c) a support, preferably the support is alumina;

wherein, when said catalyst is in its fully oxidized state, the relative content of α-NiO in the catalyst is less than or equal to 0.2 a.u., and the relative content of α-NiO in the catalyst is greater than 0.0001 a.u., for example greater than 0.001 a.u., further for example greater than 0.01 a.u..

3. The catalyst according to any one of claims 1-2, which is characterized in that based on the parts by weight,

the content of the active component is 10-60 parts, for example 15-55 parts;

the content of the auxiliary is 0.1-120 parts, for example 0.2-90 parts;

The content of said support is 0.1-45 parts, for example 1-35 parts.

4. The catalyst according to any one of claims 1-3, which is characterized in that said support is at least one of alumina, silica and zeolite, for example alumina;

preferably, said support is a support that has been treated at a temperature of not less than 500°C.

5. The catalyst according to any one of claims 1-4, which is characterized in that said support comprises alumina, wherein based on the weight of alumina, the proportions of α, β, γ, δ, θ-alumina are 0.1-99%, 0.1-99%, 0.1-99%, 0.1-99%, 0.1-99% respectively, preferably 10-95%, 1-70%, 2-90%, 5-90%, 3-80% respectively.

6. The catalyst according to any one of claims 1-5, which is characterized in that the relative content of α-NiO in the catalyst is greater than 0.0001 a.u., for example greater than 0.001 a.u., further for example greater than 0.01 a.u.; or the content of α-NiO in the catalyst is greater than 0.0001 wt%, for example greater than 0.001 wt%, further for example greater than 0.01 wt%.

7. A process for preparing the catalyst according to any one of claims 1-6, which is characterized in that said process comprises the following steps:

1) performing the first contact of a solution of auxiliary salt, a solution of first precipitant, a support and water to produce a modified support;

2) performing the second contact of a solution of nickel salt, a solution of second precipitant, the modified support obtained from step 1) and water, filtering, and calcining to produce the catalyst,

for example, in step 1), the solution of auxiliary salt and the solution of first precipitant are simultaneously added to the water containing the support to perform the first contact, and/or in step 2), the solution of nickel salt and the solution of second precipitant are simultaneously added to the water containing the modified support obtained from step 1) to perform the second contact.

8. The process according to claim 7, which is characterized in that in step 1), the used support is a support that has been treated at a temperature of not less than 500°C, preferably the used support is a support that has been treated at a temperature of higher than 500°C.

9. The process according to claim 7, which is characterized in that the resulting solution in the first contact and the resulting solution in the second contact are controlled to the endpoint pH of 6.0-10.0, for example 6.0-8.0,

for example, the temperature of said first contact and/or second contact is 50-90°C, and/or the time of said first contact and/or second contact is 3-6 hours.

10. The process according to claim 7, which is characterized in that said auxiliary salt is selected from one or more of $Mg(NO_3)_2$, $Cu(NO_3)_2$, $Co(NO_3)_2$, $Zn(NO_3)_2$, $Zr(NO_3)_4$, $(NH_4)_2MoO_4$, $Mg(NO_3)_2•6H_2O$, $Cu(NO_3)_2•3H_2O$, $Co(NO_3)_2•6H_2O$, $Zn(NO_3)_2•6H_2O$ and $Zr(NO_3)_4•5H_2O$, for example selected from one or more of $Cu(NO_3)_2$, $Zr(NO_3)_4$, $(NH_4)_2MoO_4$ and $Co(NO_3)_2$;

and/or said first precipitant is selected from one or more of sodium hydroxide, potassium hydroxide, sodium carbonate, sodium bicarbonate and ammonia water, preferably, the first precipitant is carbon-free, more preferably, the first precipitant is sodium hydroxide and/or ammonia water;

and/or the nickel salt is nickel sulphate and/or nickel nitrate, for example nickel nitrate;

and/or said second precipitant is selected from one or more of sodium hydroxide, potassium hydroxide, sodium carbonate, sodium bicarbonate and ammonia water, preferably, said second precipitant is carbonaceous, more preferably said second precipitant is sodium carbonate and/or sodium bicarbonate.

11. The process according to claim 7, which is characterized in that in step 1), said solution of auxiliary salt has a concentration of 0.1-1.5 mol/L, for example 0.3-1.2 mol/L; and/or said solution of first precipitant has a

concentration of 0.4-2.0 mol/L, for example 0.6-1.6 mol/L; and/or the content of said support in water is 5-100 g/L, for example 20-80 g/L, or 5-20 g/L, e.g. 8-15 g/L.

12. The process according to claim 7, which is characterized in that in step 2), said solution of nickel salt has a concentration of 0.2-1.5 mol/L, for example 0.5-1.2 mol/L; and/or said solution of second precipitant has a concentration of 0.4-2.0 mol/L, for example 0.6-1.5 mol/L, and/or the content of said support in water is 10-100 g/L, for example 20-85 g/L, or 10-30 g/L, e.g. 12-25 g/L.

13. A process for producing dibasic amine by hydrogenation of dibasic nitrile, comprising in the presence of the catalyzt according to any one of claims 1-6 or the catalyst prepared with the process according to any one of claims 7-12, the dibasic nitrile is contacted with hydrogen gas to generate the dibasic amine, for example, the molar ratio of hydrogen gas to dibasic nitrile is 3:1-70:1, for example 5:1-20:1,

for example, the reaction temperature is 50-120°C, for example 60-80°C; and/or said reaction pressure is 4.0-15.0 MPa, for example 4.0-12.0 MPa, further for example 6.0-10.0 MPa; and/or the liquid hourly space velocity of said reaction is 1-12 hr^{-1}, for example 2-10 hr^{-1}.

14. Use of the catalyst according to any one of claims 1-6 or the catalyst prepared with the process according to any one of claims 7-12 or the process according to claim 13 in producing dibasic amine by hydrogenation of dibasic nitrile, especially in producing aliphatic C_4-C_{24} dibasic amine (such as hexanediamine, heptanediamine, octanediamine, nonanediamine, decanediamine, undecanediamine, dodecanediamine, tridecanediamine, tetradecanediamine, pentadecanediamine, hexadecanediamine, heptadecanediamine, or octadecanediamine) or aromatic C_6-C_{18} dibasic amine (such as ortho-benzenedimethanamine, meta-benzenedimethanamine,

or para-benzenedimethanamine) by hydrogenation of aliphatic C_4-C_{24} dibasic nitrile (such as adiponitrile, pimelonitrile, suberonitrile, nonanedinitrile, decanedinitrile, undecanedinitrile, dodecanedinitrile, tridecanedinitrile, tetradecanedinitrile, pentadecanedinitrile, hexadecanedinitrile, heptadecanedinitrile, or octadecanedinitrile) or aromatic C_6-C_{18} dibasic nitrile (such as phthalonitrile, isophthalonitrile, or terephthalonitrile).