Claims

1. Catalytic reactor,

   containing a catalytic fixed bed having a volume V
   comprising a support structure and a catalyst, characterized by the following features:

   - During operation of the reaction, the catalytic fixed bed is filled with reaction medium to at least 85% by volume; and
   - the contact area of the catalyst with the reaction medium is at least 2000 m^2 per m^3 volume of the catalytic fixed bed;

   wherein the support structure is formed from material webs having a thickness of 5 to 25 µm, with a crosslinking density of at least 3 mm^{-3} present; and

   wherein the support structure consists of metals selected from elements of groups 8, 6 and 11 of the periodic table of the elements and mixtures thereof;

   and wherein the support structure is catalytically inert and serves as a support body for a catalyst that is applied to the support structure in the form of a catalytically active coating.

2. Catalytic reactor according to Claim 1,

   characterized in that
   the proportion of the catalyst applied to the support structure through coating is 2 to 500 kg per m^3 volume of the catalytic fixed bed.

3. Catalytic reactor according to Claim 2,

   characterized in that
   the catalyst contains 60% to 99.8% by weight of support oxides, 0.2% to 10% by weight of catalytically active components and optionally additives and functional components, in each case based on the total amount of catalytic coating forming the catalyst.

4. Catalytic reactor according to Claim 3,

   characterized in that
   the support oxides are selected from the group consisting of aluminium oxide, silicon dioxide, titanium oxide and mixtures thereof.

5. Catalytic reactor according to either of Claims 3 and 4,

characterized in that
the catalytically active components are selected from the group consisting of iron, ruthenium, osmium, cobalt, rhodium, iridium, nickel, palladium, platinum, copper, silver, gold and mixtures thereof.

6. Catalytic reactor according to any of Claims 1 to 5,

characterized in that
cobalt, nickel, copper and/or mixtures thereof are the principal constituent of the support structure.

7. Catalytic reactor according to Claim 6,

characterized in that
the catalyst applied to the support structure is an activated metal catalyst.

8. Catalytic reactor according to Claim 7,

characterized in that
the catalytic fixed bed contains 2% to 17% by weight of aluminium based on the total mass of the catalytic fixed bed.

9. Catalytic reactor according to either of Claims 6 and 7,

characterized in that
the activated metal catalyst is modified with a doping element selected from the group consisting of molybdenum, platinum, palladium, rhodium, ruthenium, copper and mixtures thereof.

10. Catalytic reactor according to any of Claims 1 to 9,

characterized in that
the catalytic fixed bed has a volume of 0.5 to 100 m^3.

11. Catalytic reactor according to any of Claims 1 to 10,

characterized in that
the catalytic fixed bed has a fill-weight of between 0.1 and 1 kg/m^3.