Claims

1. Catalyst composition comprising at least one ~~precious~~ metal and at least one mixed oxide, wherein the metal is selected from ruthenium, rhodium, palladium, osmium, iridium, platinum and mixtures thereof, wherein the mixed oxide comprises zirconium dioxide and silicon dioxide, ~~characterized in that~~wherein the ~~precious~~ metal is supported and the support does not consist of the mixed oxide, and wherein the mass ratio of zirconium dioxide to silicon dioxide in the mixed oxide is 86: 14 to 99.9: 0.1.

2. Catalyst composition according to Claim 1, ~~characterized in that~~wherein the support does not comprise the mixed oxide.

3. Catalyst composition according to either of the preceding claims, ~~characterized in that~~wherein the support of the ~~precious~~ metal is selected from silicon dioxide, aluminium oxide or mixtures thereof.

~~4. Catalyst composition according to one of the preceding claims, characterized in that the precious metal is selected from ruthenium, rhodium, palladium, osmium, iridium, platinum and mixtures thereof, preferably palladium.~~

~~5~~4. Process for producing ~~a~~the catalyst composition according to one of the preceding claims, ~~characterized in that~~wherein~~,~~ for the preparation of the mixed oxide,

   a) a mouldable mass is prepared which at least comprises
      i. a zirconium compound,
      ii. silicon dioxide as solid, preferably produced by means of pyrogenic methods, and
      iii. water, and
   b) the mouldable mass is calcined at a temperature of from 300 to 500°C.

~~6~~5. Process according to Claim ~~5~~4, ~~characterized in that~~wherein the ~~precious~~ metal is

impregnated on an inert support to produce the catalyst system and wherein the metal is selected from ruthenium, rhodium, palladium, osmium, iridium, platinum and mixtures thereof.

~~7~~6. Process for producing a catalyst composition, wherein the catalyst composition comprises at least one ~~precious~~ metal and at least one mixed oxide, wherein the metal is selected from ruthenium, rhodium, palladium, osmium, iridium, platinum and mixtures thereof, wherein the mixed oxide comprises zirconium dioxide and silicon dioxide, the specific surface area of the mixed oxide, measured according to BET methods, is 5 – 155 m^2/g, the ~~precious~~ metal is supported on the mixed oxide, the mixed oxide has a monomodal pore radius distribution, ~~and~~ wherein the mass ratio of zirconium dioxide to silicon dioxide in the mixed oxide is 86: 14 to 99.9: 0.1, and ~~characterized in that~~wherein, for the preparation of the mixed oxide,

a) a mouldable mass is prepared which at least comprises
   i. a zirconium compound,
   ii. silicon dioxide as solid having a particle size d_{50} (laser diffraction) of at least 100 nm, preferably produced by means of pyrogenic methods, and
   iii. water, and
b) the mouldable mass is calcined at a temperature of from 300 to 500°C.

~~8~~7. Process according to Claim ~~7~~6, ~~characterized in that~~wherein the ~~precious~~ metal is impregnated on the mixed oxide as support.

~~9~~8. Process according to one of Claims ~~5~~4 to ~~8~~7, ~~characterized in that~~wherein the particle size d_{50} (laser diffraction) of the silicon dioxide is 100 nm to 500 µm.

~~10~~9.Process according to one of Claims ~~5~~4 to ~~9~~8, ~~characterized in that~~wherein the zirconium compound is selected from zirconium dioxide, zirconium hydroxide, zirconium acetate, zirconium nitrate, zirconium oxychloride, ammonium zirconium carbonate or mixtures thereof, preferably zirconium dioxide, zirconium hydroxide or mixtures thereof.

~~11~~10. Process according to Claim ~~10~~9, ~~characterized in that~~wherein the zirconium compound is a mixture of A and B, where

A is selected from zirconium dioxide, zirconium hydroxide and mixtures thereof and

B is selected from zirconium acetate, zirconium nitrate, zirconium oxychloride, ammonium zirconium carbonate and mixtures thereof.

~~12~~11. Process according to one of Claims ~~5~~4 to ~~11~~10, ~~characterized in that~~wherein the mouldable mass is reshaped to give mouldings prior to the calcination.

~~13. Use of a catalyst composition which comprises at least one precious metal and at least one mixed oxide, where the mixed oxide comprises zirconium dioxide and silicon dioxide, the precious metal is supported on a support and where the mass ratio of zirconium dioxide to silicon dioxide in the mixed oxide is 86: 14 to 99.9: 0.1, for producing ketones from a compound containing at least one epoxide group, characterized in that the support is the mixed oxide or the support does not consist of the mixed oxide.~~

~~14~~12. Process for producing ketones, preferably cyclododecanone, from a compound containing at least one epoxide group, wherein a catalyst composition is used which comprises at least one ~~precious~~ metal and at least one mixed oxide, wherein the metal is selected from ruthenium, rhodium, palladium, osmium, iridium, platinum and mixtures thereof and wherein the mixed oxide comprises zirconium dioxide and silicon dioxide, the ~~precious~~ metal is supported on a support, ~~and~~ wherein the mass ratio of zirconium dioxide to silicon dioxide in the mixed oxide is 86: 14 to 99.9: 0.1, and ~~characterized in that~~wherein the support is the mixed oxide or the support does not consist of the mixed oxide.

~~15~~13. Process for the synthesis of lactams, in which a~~the~~ process for producing ketones according to Claim ~~14~~12 is used.