CLAIMS

1. A process for preparing an amorphous silica-alumina composition, wherein the process comprises the steps of:

(a) mixing an aqueous solution of a silicon compound and an aqueous solution of an aluminum compound which is an aluminum salt or an alkali metal aluminate, and an acid, while maintaining a pH of the mixed solution in a range of 1 to 3, and obtaining an acidified silica-alumina sol;

(b) adding an aqueous solution of a base precipitating agent to the acidified silica-alumina sol and mixing the combination of the aqueous solution of the base precipitating agent and the acidified silica-alumina sol while maintaining pH within a range of 6.5 to 7.5 and applying back pressure to prevent carbonate from leaving the mixture via CO_2 evolution, and co-precipitating a silica-alumina slurry, wherein the base precipitating agent is selected from ammonium carbonate, ammonium bicarbonate, and any combination thereof;

(c) optionally, hydrothermally aging the silica-alumina slurry to form a hydrothermally aged silica-alumina slurry; and

(d) recovering a precipitate solid from the silica-alumina slurry or the hydrothermally aged silica-alumina slurry, wherein the precipitate solid comprises the silica-alumina composition, with the silica-alumina precipitate solid comprising from 5 to 15 wt. % of a crystalline phase which is ammonium aluminum carbonate hydroxide hydrate.

2. The process according to claim 1, further comprising subjecting the silica-alumina composition obtained in step (d) to washing, ion exchange, drying and/or calcination.

3. The process according to claim 2, which comprises spray drying the silica-alumina composition obtained in step (d).

4. The process of claim 1, wherein the silicon compound is selected the group consisting of an alkali metal silicate, silicic acid, colloidal silica, precipitated silica, fumed silica, and any combination thereof.

5. The process of claim 1, wherein the silicon compound is sodium silicate.

6. The process of claim 5, wherein the sodium silicate has a SiO_2/Na_2O weight ratio in a range of from 2.5 to 3.5.

7. The process of claim 1, wherein the aqueous solution comprising the silicon compound comprises the silicon compound in an amount ranging from 2% to 15% by weight of silicon, expressed as SiO_2.

8. The process of claim 1, wherein the aqueous solution comprising the aluminum compound comprises the aluminum compound in an amount ranging from 2% to 25% by weight of aluminum, expressed as Al_2O_3.

9. The process of claim 1, wherein the acid is selected from the group consisting of formic acid, acetic acid, hydrochloric acid, nitric acid, sulfuric acid, and any combination thereof.

10. The process of claim 1, wherein hydrothermal aging in step (c) is carried out at a temperature of from 20°C to 200°C for a period of from 1 to 6 hours.

11. The process of claim 1, wherein the aluminum salts comprise aluminum halides.

12. A silica-alumina composition comprising amorphous silica-alumina having a total pore volume of at least 1.0 cm^3/g; wherein the silica-alumina composition, in its

dried form, contains from 5 to 30 wt.% of a crystalline phase which is ammonium aluminum carbonate hydroxide,.

13. The silica-alumina composition of claim 12, wherein the amorphous silica-alumina has a pore volume in a range of from 1.0 cm^3/g to 2.0 cm^3/g.

14. The silica-alumina composition of claim 12, wherein the silica-alumina composition, in its dried form, contains from 5 to 20 wt.% of a crystalline phase which is ammonium aluminum carbonate hydroxide.

15. The silica-alumina composition of claim 12, wherein the silica-alumina composition, in its dried form, contains from 5 to 15 wt.% of a crystalline phase which is ammonium aluminum carbonate hydroxide.

16. The silica-alumina composition of claim 12, wherein the amorphous silica-alumina has a silica content in a range of from 20 wt.% to 80 wt.% and an alumina content in a range of from 20 wt.% to 80 wt.%.

17. The silica-alumina composition of claim 12, wherein the amorphous silica-alumina has a B.E.T. surface area in a range of from 300 m^2/g to 500 m^2/g.

18. The silica-alumina composition of claim 12, wherein the amorphous silica-alumina composition has a mesopore volume of at least 0.7 cm^3/g.

19. The silica-alumina composition of claim 12, wherein the amorphous silica-alumina composition has a porosity such that a volume of mesopores with a diameter in a range of from 200 Å to 500 Å represents 30% to 80% of the total pore volume measured by nitrogen physisorption.

20. A continuous process for preparing a silica-alumina composition, wherein the process comprises the steps of:

(a) continuously contacting and mixing an aqueous solution of a silicon compound and an aqueous solution of an aluminum compound and an acid in a first mixing zone, while maintaining a pH of the mixed solution in a range of 1 to 3;

(b) removing a first mixture from the first mixing zone continuously, wherein the first mixture comprises an acidified silica-alumina sol;

(c) continuously contacting and mixing the first mixture and an aqueous solution of a base precipitating agent in a second mixing zone while maintaining a pH in a range of from 5 to 8 to produce a silica-alumina slurry, wherein the base precipitating agent is selected from ammonium carbonate, ammonium bicarbonate, and any combination thereof;

(d) removing the silica-alumina slurry from the second mixing zone continuously; and

(e) recovering a precipitate solid from the silica-alumina slurry, wherein the precipitate solid comprises the silica-alumina composition, with the silica-alumina precipitate solid comprising from 5 to 15 wt. % of a crystalline phase which is ammonium aluminum carbonate hydroxide hydrate.