CLAIMS

1. A method for coating nickel on an organosiloxane polymer comprising:

forming a transition metal oxide on the organosiloxane polymer;

etching the transition metal oxide with a basic solution;

contacting the organosiloxane polymer comprising the etched transition metal oxide with an aqueous solution comprising a positively charged species to attach the positively charged species on the etched transition metal oxide;

depositing a metal catalyst on the positively charged species; and

treating the metal catalyst with an acidic solution to develop an activated organosiloxane polymer before transferring the activated organosiloxane polymer to a solution comprising nickel and/or nickel derivatives.

2. The method according to claim 1, wherein the organosiloxane polymer is selected from the group consisting of polydimethylsiloxane, vinyl methyl polysiloxane, phenyl methyl polysiloxane, phenyl vinyl methyl polysiloxane, fluoro vinyl methyl polysiloxane, and derivatives of silicone rubber, wherein the polysiloxane comprises at least one quaternary silicon.

3. The method according to claim 1, wherein the transition metal oxide comprises titanium oxide.

4. The method according to claim 1, wherein the forming comprises contacting the organosiloxane polymer with a solution comprising a swelling agent and a transition metal oxide precursor for up to 30 minutes, and drying the organosiloxane polymer in ambient conditions comprising a temperature from 15°C to 30°C and a relative humidity from 30% to 70% to form the transition metal oxide on the organosiloxane polymer.

5. The method according to claim 4, wherein the swelling agent comprises isopropyl alcohol.

6. The method according to claim 4, wherein the transition metal oxide precursor comprises titanium isopropoxide.

7. The method according to claim 4, wherein the transition metal oxide precursor and the swelling agent comprise a volume ratio of 1:1 to 1:99.

8. The method according to claim 1, wherein the positively charged species attached on the etched transition metal oxide changes polarity of charges present on the etched transition metal oxide.

9. The method according to claim 8, wherein the positively charged species is selected from the group consisting of positively charged nanoparticles or nanocolloids, dendrimers comprising nitrogen, polymers having at least one primary amine, secondary amine, tertiary amine, pyridinyl, quaternized amine, quaternized pyridinyl, and their mixtures thereof.

10. The method according to claim 1, wherein the metal catalyst comprises tin-palladium (Sn-Pd) colloidal metal catalyst.

11. The method according to claim 10, wherein the tin-palladium colloidal metal catalyst is prepared by:

dissolving $PdCl_2$ in an amount of 0.05 gram to 0.15 gram in 30 ml to 50 ml of HCl to form a first solution;

dissolving $SnCl_2$ in 10 ml to 30 ml of HCl and subsequently adding 10 ml to 30 ml of water to form a second solution;

mixing the first and second solutions, and continuously stirring the mixture for 10 minutes to 30 minutes;

dissolving 4 gram to 5 gram of NaCl, 0.4 gram to 1.2 gram of $NaSnO_3$ and 5 gram to 15 gram of $SnCl_2$ in 40 ml to 60 ml of water to form a third solution;

adding the third solution to the mixture over a duration of 20 minutes to 40 minutes; and

incubating the mixture under continuous stirring for 3 hours to 5 hours at 60°C to 70°C.

12. The method according to claim 11, wherein concentration of the HCl forming the first solution and the second solution is 4 to 8 M and 9 to 12 M, respectively.

13. The method according to claim 1, wherein the solution comprising nickel and/or nickel derivatives is prepared by mixing 4 to 6 g/l of $NiSO_4$, 0.5 to 1.5 g/l of NaH_2PO_4, 0.5 to 1.5 g/l of oxycarboxylic acid, and an amount of ammonia sufficient to maintain pH of the ENP solution between 4.5 and 5.5.

14. The method according to claim 1, wherein the forming further comprises preparing the organosiloxane polymer, wherein the preparing comprises:

blending an organosiloxane polymer precursor with a cross-linking agent to form a blended mixture and curing the blended mixture at 170°C to 180°C under 8 MPa to 12 MPa for at least 5 minutes; or

mixing two organosiloxane polymer precursors with a curing agent and curing at 25°C to 35°C for 48 hours.