CLAIMS

1. A nickel organosiloxane polymer composite comprising:

a transition metal oxide layer formed on the organosiloxane polymer; and

a positively charged species attached on the transition metal oxide layer with nickel coated on the positively charged species.

2. The nickel organosiloxane polymer composite according to claim 1, wherein the nickel organosiloxane polymer further comprises a trace amount of Sn-Pd catalyst under the nickel coated on the positively charged species.

3. The nickel organosiloxane polymer composite according to claim 1 or 2, 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 a quaternary silicon.

4. The nickel organosiloxane polymer composite according to any one of claims 1 to 3, wherein the transition metal oxide layer comprises titanium oxide.

5. The nickel organosiloxane polymer composite according to claim 4, wherein the transition metal oxide layer is selected from the group consisting of titanium oxide, zirconium oxide, vanadium oxide, hafnium oxide, niobium oxide and tantalum oxide.

6. The nickel organosiloxane polymer composite according to any one of claims 1 to 5, 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 and/or quaternized pyridinyl and their mixtures thereof.

7. The nickel organosiloxane polymer composite according to claim 6, wherein the positively charged nanoparticles or nanocolloids comprise

cetyltrimethylammonium bromide (CTAB) stabilized gold nanoparticles, spermidine stabilized silver nanoparticles, 2-(dimethylamino)ethanethiol-capped CdTe quantum dots and/or their mixtures thereof.

8. The nickel organosiloxane polymer composite according to claim 6, wherein the dendrimers comprise polyamidoamine dendrimers, polyethylenimine dendrimers, polypropylenimine hexadecaamine dendrimers, ammonium-capped thiophosphoryl chloride dendrimers, ammonium-capped cyclotriphosphazene dendrimers and/or their mixtures thereof.

9. The nickel organosiloxane polymer composite according to claim 6, wherein the polymers comprise polyamine, polyallylamine, polyetheramine, polyethylenimine, polyvinylpyridine, polybrene, chitosan, poly(2-(trimethylamino)ethyl methacrylate), poly(diallyldimethylammonium chloride), poly(N,N-dimethyl-3,5-dimethylene-piperidinium chloride), poly(2-vinyl-1-methylpyridinium bromide) and/or their mixtures thereof.

10. The nickel organosiloxane polymer composite according to any one of claims 1 to 9, wherein the nickel, the Sn-Pd catalyst, the positively charged species and the transition metal oxide layer comprise a thickness of 2.52 to 3 μm.