Claims

1. A room-temperature curable inorganic coating comprising:

70-80wt% of a solution, wherein the solution comprises 30-40wt% of an alkoxy-silane, 15-20wt% of an organic solvent, and 25-30wt% of a silica sol, wherein the alkoxy-silane is represented by a formula of:

$$R^1{}_mSi(OR^2)_{4-m},$$

wherein each of R^1 and R^2 is an alkyl group, the alkyl group is represented by a general formula of "C_nH_{2n+1}", wherein n is a positive integer, and n is 1-10;

wherein the total number of "R^1" and "OR^2" is 4, m is a non-negative integer, and m is 0-3;

5-10wt% of a first functional additive selected from potassium titanate, alumina or mixtures thereof;

10-20wt% of an inorganic pigment; and

0.5-2.0wt% other functional additive is selected from tourmaline, rare-earth ore or a mixture thereof;

wherein said percent is weight percent of each component based on total weight of inorganic coating.

2. The inorganic coating of claim 1, wherein alkoxy-silane comprises at least one of selected from the group including methyl, ethyl, phenyl, $CF_3CH_2CH_2$, CF_3 $(CF_2)_5CH_2CH_2$, and CF_3 $(CF_2)_7CH_2CH_2$.

3. The inorganic coating of claim 1, wherein the silica sol comprises 20-40wt% silica (SiO_2) particles, the particle size of the silica is from nano-size to micron-size; the inorganic coating also comprises deionized water.

4. The inorganic coating of claim 1, wherein the first functional additive comprises 3-5wt% potassium titanate.

5. The inorganic coating of claim 1, wherein the "OR^2" is hydrolyzable alkoxy group, which is hydrolyzed by water, creating "silicon-hydroxyl" (Si-OH) group, which bonds with the surfaces of the substrate through Si-O-M bond, M represents substrate.

6. The inorganic coating of claim 1, wherein the alkoxy-silane is selected from methyl trimethoxy silane, tetraethoxysilane, phenyl trimethoxy silane, or a mixture thereof.

7. A method for preparing the inorganic coating of claim 1, by combining components of the inorganic coating to prepare a main agent and a curing agent, wherein a method for preparing the main agent comprises stirring a silica sol, adding an organic solvent, stirring continuously, adding deionized water again and stirring continuously, wherein the reaction temperature is controlled not to exceed 50°C, and wherein said organic solvent is at least one selected from the group including methanol, ethanol, isopropanol; and

wherein a method for preparing the curing agent comprises adding an organic alkoxy-silane, a first functional additive, an inorganic pigment, and other functional additives to deionized water, stirring and mixing homogeneously.

8. A method for preparing the inorganic coating of claim 1, wherein the method comprises the following steps:

(1) preparing an inorganic solution by mixing 30-40wt% alkoxy-silane, with 15-20wt% of an organic solvent, and 25-30% of a silica sol, stirring the mixture under 40-50°C for 5-10 minutes, getting an inorganic solution in sol state;

(2) preparing an inorganic coating mixture by putting the inorganic solution got in step (1), 5-10wt% of a first functional additive, 10-20wt% of an inorganic pigment, and 0.5-2.0wt% of other functional additives together, and stirring the mixture to get the inorganic ceramic mixture;

(3) putting the inorganic ceramic mixture got in step (2) in a homogenizer; and stirring it at a high speed for 1-2 hours to make the particles homogenized; and

(4) filtering the homogenized matter got in step (3) pass through a 325-1000 mesh net, and the matter after filtering is the said inorganic coating.