CLAIMS

1. A silicon powder composition for producing hydrogen, wherein: comprises silicon powder, precipitation agent and alkaline substance; said alkaline substance is the weak acid salt of alkali metal; the mass ratio of said alkaline substance to the silicon in the silicon powder, is greater than or equal to 0.06:1, and less than or equal to 4:1; said silicon powder is the silicon powder with average particle diameter of less than or equal to 1mm; the molar stoichiometric ratio of said precipitation agent to the silicon in the silicon powder, is greater than or equal to 0.12:1, and less than or equal to 4:1.

2. The silicon powder composition of claim 1, wherein: the mass ratio of said alkaline substance to the silicon in the silicon powder, is greater than or equal to 0.25:1, and less than or equal to 1:1.

3. The silicon powder composition of claim 1, wherein: the alkali metal of said "weak acid salt of alkali metal" is Na and/or K.

4. The silicon powder composition of claim 1, wherein: the pKa in normal temperature 25℃ of the weak acid of said "weak acid salt of alkali metal", is greater than 9.50 and less than 13.00; In case the weak acid has multiple pKa, the maximum pKa is the benchmark.

5. The silicon powder composition of claim 1 or 4, wherein: said weak acid, is meta-aluminic acid, meta-silicic acid, carbonic acid, or the mixture thereof.

6. The silicon powder composition of claim 1, wherein: the salt formed by the acid radical of said alkali metal weak acid salt and the metal element in said precipitation agent, has solubility in water less than 1gram/100gram.

7. The silicon powder composition of claim 1, wherein: said precipitation agent is metal oxide, metal hydroxide, or the mixture thereof; the metal element in said precipitation agent is Ca.

8. The silicon powder composition of claim 1, wherein: the purity of silicon in

said silicon powder is greater than or equal to 50% (w/w); and/or, the average particle diameter of said silicon powder is less than or equal to 0.3mm.

9. A method for producing hydrogen, wherein comprises following processes: in the reaction temperature of 40℃~160℃, reacts the silicon powder composition of any one of claim 1~8 with water.

10. The method of claim 9, wherein: said reaction temperature is 80℃~120℃.

11. The method of claim 9 or 10, wherein: the pressure (gauge pressure) of said reaction is 1~9Bar.

12. A reactor, wherein: said reactor comprises the composition of any one of claim 1~8; said reactor is equipped with water input port and hydrogen output port.

13. The reactor of claim 12, wherein: the water input port and hydrogen output port of said reactor are not on a same plane; and/or, said reactor is cylindrical.

14. A reaction device for producing hydrogen, wherein: comprises the reactor of claim 12 or 13, and a liquid container; said liquid container is directly or indirectly connected to the reactor; said connection is fixed or dismountable connection.

15. The reaction device of claim 14, wherein: said reaction device, also comprises a heater; and/or, said reaction device, also comprises a thermal insulation cover enveloping said reactor.