What is claimed is:

1. A method for preparing a chromium-silicon alloy sputtering target material, comprising the following steps:

(1) mixing a chromium powder and a silicon powder under a non-oxidizing atmosphere to obtain a mixed powder;

(2) performing die filling, and performing vacuum hot-pressing sintering on the mixed powder obtained after the die filling; and

(3) performing furnace cooling after the vacuum hot-pressing sintering is finished to obtain the chromium-silicon alloy sputtering target material~~.~~;

wherein the vacuum hot-pressing sintering comprises the following steps:

(a) vacuumizing to an absolute vacuum degree of below 100 Pa, and performing first programmed temperature rise, wherein the first programmed temperature rise is performed at a pressure which does not exceed 5 MPa;

(b) performing first heat preservation after the first programmed temperature rise is finished, and sequentially performing second programmed temperature rise and second heat preservation; and

(c) performing pressurization after the second heat preservation is finished, and performing heat preservation and pressure maintaining after the pressurization is finished.

2. The preparation method according to claim 1, wherein the chromium powder has a purity of greater than or equal to 99.95%.

3. The preparation method according to claim 1 or 2, wherein the mass percentage of silicon in the mixed powder is 50 wt% to 70 wt%.

4. The preparation method according to ~~nay~~any one of claims 1 to 3, wherein the chromium powder has a particle size of less than 45 μm;

optionally, the silicon powder has a purity of greater than or equal to 99.99%; and

optionally, the silicon powder has a particle size of less than 3 μm.

5. The preparation method according to any one of claims 1 to 4, wherein the non-oxidizing atmosphere in step (1) comprises a nitrogen atmosphere and/or an inert atmosphere; and

optionally, the inert atmosphere comprises any one or a combination of at least two of a helium atmosphere, a neon atmosphere, an argon atmosphere or a krypton atmosphere.

6. The preparation method according to any one of claims 1 to 5, wherein the mixing in step (1) is performed in a ball mill;

optionally, the mill balls when the mixing is performed in the ball mill are silicon balls and/or chromium balls;

optionally, a ratio of material to grinding media when the mixing is performed in the ball mill is (8 to 12):1; and

optionally, the mixing in step (1) is performed for at least 24 hours.

7. The preparation method according to any one of claims 1 to 6, wherein the die filling in step (2) is to feed the mixed powder into a graphite mold; and

optionally, the flatness after the die filling in step (2) is less than or equal to 0.5 mm.

~~8. The preparation method according to any one of claims 1 to 7, wherein the vacuum hot-pressing sintering comprises the following steps:~~

~~(a) vacuumizing to an absolute vacuum degree of below 100 Pa, and performing first programmed temperature rise, wherein the first programmed temperature rise is performed at a pressure which does not exceed 5 MPa;~~

~~(b) performing first heat preservation after the first programmed temperature rise is finished, and sequentially performing second programmed temperature rise and second heat preservation; and~~

~~(c) performing pressurization after the second heat preservation is finished, and performing heat preservation and pressure maintaining after the pressurization is finished.~~

~~9~~8. The preparation method according to any one of claims 1 to 7~~claim 8~~, wherein

the first programmed temperature rise in step (a) is performed at a heating rate of 6℃/minute to 10℃/minute; and

optionally, the first programmed temperature rise in step (a) ends at a temperature of 950℃ to 1050℃.

~~10~~9. The preparation method according to any one of claims 1 to 8~~claim 8 or 9~~, wherein the first heat preservation in step (b) is performed for 50 minutes to 80 minutes;

optionally, the second programmed temperature rise in step (b) is performed at a heating rate of 3℃/minute to 6℃/minute;

optionally, the second programmed temperature rise in step (b) ends at a temperature of 1100℃ to 1300℃; and

optionally, the second heat preservation in step (b) is performed for at least 1 hour.

~~11~~10. The preparation method according to any one of claims ~~8 to 10~~1 to 9, wherein the pressurization in step (c) is to perform uniform pressurization to 30 MPa within 2 hours, wherein the pressurization is performed at a constant temperature; and

optionally, the heat preservation and pressure maintaining in step (c) are performed for 80 minutes to 100minutes.

~~12~~11. The preparation method according to any one of claims 1 to ~~11~~10, comprising the following steps:

(1) mixing a chromium powder with a particle size of less than 45 μm and a silicon powder with a particle size of less than 3 μm under a non-oxidizing atmosphere to obtain a mixed powder; wherein the mass percentage of silicon in the mixed powder is 50 wt% to 70 wt%;

(2) performing die filling in a graphite mold until the flatness is less than or equal to 0.5 mm, and performing vacuum hot-pressing sintering on the mixed powder obtained after the die filling; and

(3) performing furnace cooling after the vacuum hot-pressing sintering is finished to obtain the chromium-silicon alloy sputtering target material;

wherein the vacuum hot-pressing sintering in step (2) comprises the following steps:

(a) vacuumizing to an absolute vacuum degree of below 100 Pa, and performing first programmed temperature rise, where the first programmed temperature rise is performed at a pressure which does not exceed 5 MPa, and the first programmed temperature rise is performed at a heating rate of 6℃/minute to 10℃/minute to 950℃ to 1050℃;

(b) performing heat preservation for 50 minutes to 80 minutes after the first programmed temperature rise is finished, and sequentially performing second programmed temperature rise and second heat preservation; wherein the second programmed temperature rise is performed at a heating rate of 3℃/minute to 6℃/minute to 1100℃ to 1300℃, and the second heat preservation is performed for at least 1 hour; and

(c) performing uniform pressurization to 30 MPa within 2 hours at a constant temperature after the second heat preservation is finished, and performing heat preservation and pressure maintaining for 80 minutes to 100 minutes after the pressurization is finished.