CLAIMS

1. A method of growing an epitaxial layer on a substrate (20) of monocrystalline Silicon Carbide, SiC, comprising:

- providing (S100) a source material (10) of monolithic polycrystalline Silicon Carbide, SiC, with a columnar micro-grain structure and a substrate (20) of monocrystalline SiC, in a chamber (5) of an inner container (31, 32) of a crucible with a distance therein between,

- arranging (S102) a carbon getter (1) in said chamber (5) of the crucible to achieve a stable and suitable Si/C stoichiometry in the inner container (31, 32), said carbon getter (1) having a melting point higher than 2200° C and having an ability of forming a carbide layer with carbon species evaporated from SiC,

- reducing (S106) pressure in the chamber (5),

- inserting (S108) an inert gas into the chamber (5) and after insertion keeping the pressure higher than 0,01 mbar,

- raising (S110) the temperature in the chamber (5) to a growth temperature, such that a growth rate between 1 µm/h and 1 mm/h, is achieved, and

- keeping (S112) the growth temperature until a growth of at least 5 µm has been accomplished on the substrate (20).

2. The method according to claim 1, wherein raising the temperature is made with an increase of 10° C/min to 50° C/min.

3. The method according to any one of claims 1 or 2, wherein the temperature is raised to between 1550° C and 2300° C.

4. The method according to any one of claims 1 to 3, wherein the pressure during the raising phase (S110) is between 150 mbar to 950 mbar and the pressure during the keeping phase (S112) is reduced to 0.1 mbar to 10 mbar.

5. The method according to claim 4, wherein the pressure in the keeping phase (S112), is reduced after the growth temperature has been reached at a pumping rate of 1 mbar/min to 10 mbar/min until a pressure of 0.1 mbar to 10 mbar.

6. The method according to any one of claims 1 to 3, wherein the pressure during the raising (S110) phase and the keeping (S112) phase is 0,01 mbar to 25 mbar.

7. The method according to any one of the preceding claims, wherein the source material (10) has a micro grain size less than 250 µm when measured using a scanning electron microscope.

8. The method according to claim 7, wherein the micro grain of the source material (10) has a cubic structure oriented in the [111] or [110] crystal plane.

9. The method according to any one of the preceding claims, wherein the carbon getter (1) is chosen in the group consisting of: Tantalum, niobium and tungsten and has the shape of a foil.

10. The method according to any one of claims 1 to 8, wherein the carbon getter (1) is chosen in the group consisting of: Tantalum, niobium and tungsten and comprises several pieces distributed throughout the inner container (31, 32).

11. The method according to any one of the preceding claims, wherein a surface of substrate (20) has a root-mean-square roughness lower than 5 nm.

12. The method according to any one of the preceding claims, further comprising providing a spacer (3) between the source material (10) and the substrate (20) in order to keep the distance between the substrate (20) and the source material (10) fixed at a distance in the range of 0.5 mm-2.5 mm.