WHAT IS CLAIMED IS:

1. A planarization method for planarizing a separation surface of a silicon carbide ingot after a focal point of a laser beam with such a wavelength as to be transmitted through silicon carbide is positioned at a depth corresponding to a wafer to be generated from an end surface of the silicon carbide ingot and the silicon carbide ingot is irradiated with the laser beam to form a separation layer in which silicon carbide is separated into silicon and carbon and cracks are isotropically generated along a c-plane, and the wafer is separated from the silicon carbide ingot at the separation layer, the planarization method comprising:

a grinding step of holding an opposite side to the separation surface in the silicon carbide ingot by a rotatable chuck table and rotating a grinding wheel having a plurality of grinding abrasives disposed in a ring manner to grind the separation surface of the silicon carbide ingot held by the chuck table; and

a flatness detection step of irradiating the separation surface of the silicon carbide ingot exposed from the grinding wheel with light and detecting reflected light to detect a degree of flatness, wherein:

the grinding step is ended when it has been

detected in the flatness detection step that the separation surface of the silicon carbide ingot has become flat,

wherein:

in the flatness detection step, detecting that the separation surface has become flat comprises irradiating the separation surface with the light at an oblique incident angle θ, and receiving the reflected light at an oblique reflection angle θ, and determining when an amount of received light surpasses a threshold, wherein said oblique incident angle θ is equal to said oblique reflection angle θ.

2. The planarization method according to claim 1, further comprising a grinding water removing step of spraying compressed air upon an area of the silicon carbide ingot in a vicinity of where the light is irradiated during the flatness detection step to thereby remove grinding water therefrom.

3. A planarization method for planarizing a separation surface of a silicon carbide ingot after a focal point of a laser beam with such a wavelength as to be transmitted through silicon carbide is positioned at a depth corresponding to a wafer to be generated from an end surface of the silicon carbide ingot and the silicon

carbide ingot is irradiated with the laser beam to form a separation layer in which silicon carbide is separated into silicon and carbon and cracks are isotropically generated along a c-plane, and the wafer is separated from the silicon carbide ingot at the separation layer, the planarization method comprising:

a grinding step of holding an opposite side to the separation surface in the silicon carbide ingot by a rotatable chuck table and rotating a grinding wheel having a plurality of grinding abrasives disposed in a ring manner to grind the separation surface of the silicon carbide ingot held by the chuck table; and

a flatness detection step of irradiating the separation surface of the silicon carbide ingot exposed from the grinding wheel with light and detecting reflected light to detect a degree of flatness, wherein:

the grinding step is ended when it has been detected in the flatness detection step that the separation surface of the silicon carbide ingot has become flat,

wherein:

if the wafer to be generated is separated from the separation layer of the silicon carbide ingot in which an off-angle α is formed by the c-plane and the end surface,

in the flatness detection step, detecting that the separation surface has become flat comprises emitting the light from a light emitting element perpendicularly to the separation surface, receiving the reflected light at a position at which an angle formed with the light emitting element is 2α, and determining when an amount of received light falls below a threshold.

4. The planarization method according to claim 3, further comprising a grinding water removing step of spraying compressed air upon an area of the silicon carbide ingot in a vicinity of where the light is irradiated during the flatness detection step to thereby remove grinding water therefrom.