COMPOSITE STRUCTURE COMPRISING A WORKING LAYER MADE OF SINGLE-CRYSTAL SIC ON A CARRIER SUBSTRATE MADE OF POLYCRYSTALLINE SIC AND PROCESS FOR FABRICATING SAID STRUCTURE

ABSTRACT

The invention relates to a process for fabricating a composite structure comprising a working layer made of single-crystal silicon carbide placed on a carrier substrate made of polycrystalline silicon carbide, the process comprising:

a) a step of providing an initial substrate made of polycrystalline silicon carbide, having a front side and comprising grains the average size of which, in the plane of said front side, is larger than 0.5 μm;

b) a step of forming a surface layer made of polycrystalline silicon carbide on the initial substrate, in order to form the carrier substrate, the surface layer being made up of grains the average size of which is smaller than 500 nm, and having a thickness comprised between 50 nm and 50 μm;

c) a step of preparing a free surface of the surface layer of the carrier substrate, in order to obtain a roughness lower than 1 nm RMS;

d) a step, based on molecular bonding, of transferring the working layer to the carrier substrate, the surface layer being positioned between the working layer and the initial substrate.

The invention further relates to the carrier substrate made of polycrystalline silicon carbide, and to the composite structure comprising a working layer made of single-crystal silicon carbide placed on a carrier substrate.

Fig. 3d