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**T.D. Karimbayev, M.A. Mezentsev, A.I. Alferov, S.K. Gordeev**

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Skeleton-D is a ceramic material based on the silicon carbide reinforced by diamond particles. Skeleton-D is characterized by a unique combination of elastic, thermal-conductivity, hardness and durability properties. Batch of ball bearings made of Skeleton-D has been fabricated, machined and tested. Strength behavior of ceramics bearings with balls made of Skeleton-D was performed (p. 12-27; fig. 16).

**K.L.Vyshniakova, L.N.Pereselentseva, V.P.Red'ko, T.V.Tomila**

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There were studied physical-chemical processes occurring at the processing of the pine wood impregnated with silica in alkali medium in order to obtain nanostructure/silicon carbide. It was shown that SiC synthesis is resulted from the silicon oxycarbide decomposition that was formed, in its turn, as the result of the wood pyrolysis and the secondary processes of carbothermal reduction of silica (p. 28-35; fig. 4).

**S.V.Digonsky and V.V.Ten**

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In the silicon-carbon phase diagram there exists an area between carbon content of 0.75 and at 0.27 at. % and temperatures between 1402 °C and 2540 °C, which includes solutions of carbide in silicon characterized by unusual physical and chemical properties. Results of a large number of the studied of processes going on during sintering of SiC-based ceramics have allowed obtaining a novel SiC/Si composite with a density of 2/88 g/cm<sup>3</sup> and a porosity of 10.3%. These characteristics look better than those of heater «Globar-SG». In a technological process developed, inclusions of secondary silicon carbide occur in either submicron or amorphous shape. They strengthen a composite microstructure of the material, which yields its unusual physical properties, wear resistance and resistance to sharp temperature changes.

A combination of the properties of the material developed determines its possible applications, such as crucible materials contacting with metal melts, liners in nozzles, vanes working at high temperatures in oxidizing atmosphere, rotating elements with low friction and high wear resistance working at high temperatures, brushes of high wear resistance for various electric machines, various valves subjected to impact loadings, high temperatures heaters for aggressive environments (p. 36-55; fig. 12).