

Original Article

## Surface Property Change of the Silicon Carbide Ceramics during the Space Exposure for Two Years

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### Abstract

The property change of the two kinds of silicon carbide ceramics (hot-pressed SiC (HP) and reaction-sintered SiC (RS)) after 315-day and 865-day space exposure was evaluated. Solar absorptance of the space-exposed specimens and reference specimen which were irradiated by atomic oxygen (AO) on the ground increased markedly compared with that of the blank (untreated) specimen. After 315-day exposure, surface roughness of both the space-exposed specimens and the AO-irradiated specimens increased compared with the blank specimen, but after 865-day exposure it decreased. A large number of tiny particles were observed at the grain boundary parts of the space-exposed RS silicon carbide ceramics. Surface of SiC particles of both the specimens after 865-day exposure looked smooth and covered with a different layer with wavy texture. The oxygen content of both space-exposed HP and RS specimens' surface where was not covered by a fixture jig increased markedly compared with those of blank, AO-irradiated specimens and the covered part of the space-exposed specimens' surface and increased with increase in space exposure duration. It is concluded that the surface of SiC specimens was oxidized mainly due to the AO-irradiation, but other contribution should be included.