

High Temperature Oxidation of Alloy Fibers: A Marker Study

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Fine advanced alloy fibers are emerging as excellent candidates in hot gas- gas separation. High temperature oxidation behavior of Fe-Cr-Al alloy fiber media consisting of random nonwoven felt like structure was investigated at temperatures of 1073 and 1255K in dry air. Two types of Fe- Cr-Al alloy, Hoskins 875 and Fe-Cr-Al-Mo were used in the present study. It was observed that the oxidation kinetics obeys the parabolic law. A sol gel derived ZrO₂ thin layer was deposited on fibers as a marker to study the oxidation mechanism at temperatures of 1073 and 1255K. The scale morphology was studied by scanning electron microscopy. X-ray photoelectron spectroscopy (XPS) was used to study the surface chemistry. A depth profile by Auger electron spectroscopy (AES) was carried out to investigate the diffusion mechanism of fibers during oxidation.