

Editorial

Corrosion of Ceramic Matrix Composites

Within the frame of the Sixth International Conference “High Temperature Corrosion and Protection of Materials”, which took place on the small island of Les Embiez in France from 16/5/2004 to 21/5/2004, we organized a workshop entitled “Corrosion of Ceramic Matrix Composites”. This workshop did not only reflect the importance of ceramic composites in the world of materials serving in harsh environments, it presented also a number of results on a specific group of composites, the electroconductive composites, which were investigated by a EU-sponsored Research Training Network (HPRN-CT-2000-00044).

The workshop and the papers of this volume show several trends. Firstly, the demand for materials withstanding oxidative environments at ever increasing temperatures (“ultra-high temperature ceramics”) is unbroken. New approaches, e.g. with superior coatings or improved microstructure, necessitate deeper understanding of the nature of mechanical damage inflicted and the kinetics of the processes.

Secondly, in the mid-temperature range with T_{\max} below 1400 °C, improved electroconductive composites emerge. The conductive phases of those composites are usually group IV nitrides or borides, which oxidize already at low temperatures. However, the interplay between the matrix and these phases can make them more resistant. They can be machined by electrodischarge methods and have the potential to tell

about their corrosion history via changing conductive properties. Therefore we view them as potential smart materials in corrosive environments.

A third trend is to use several techniques to monitor corrosion simultaneously. This is necessary because composites do usually behave complex due to their multi-phase nature. We observe more high-resolution and in situ studies. Composite users ask for satisfying predictive models for corrosion damage. From the detailed studies presented in this issue it is plain that this is a challenge in each single case.

Klaus G. Nickel
*University Tübingen, Institute for Geosciences
Applied Mineralogy, Wilhelmstr. 56
D-72074 Tuebingen, Germany*
Corresponding author. Tel.: +49 7071 2976802
E-mail address: klaus.nickel@uni-tuebingen.de

Jean Desmaison
*Université de Limoges, Sciences des Procédés Céramiques
et de Traitements de Surface (SPCTS-CNRS)
UMR 6638
123 Avenue Albert Thomas
F-87060 Limoges Cedex, France*
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