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GUEST EDITORIAL

Oxidation of New Materials and Composites

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The use of aggressive atmospheres at high temperatures spurs the development of new materials and composites able to resist in such environments.

Even "classical" chromia- or alumina-scale-forming steels need some improvement to better behave in specific atmospheres; interconnects used in solid oxide electrolyzer cells and FeCrAl alloys immersed in liquid lead represent recent developments of those well-known materials.

Intermetallics, as bulk materials or coatings, have been developed for their particular properties at high temperature. As coatings, they typically require high-temperature processing conditions that are open for optimization. Research focused on improvements of micro-alloyed steels, development of new types of coatings (using flame spray technology), progress in powder metallurgy, and the use of self-healing ceramic matrix composites provides strong evidence for the huge activity within the scientific community in the fields of new materials and composites.

Among them, high-entropy alloys are the most recent and probably the most promising because of their specific properties given by their constitution of equimolar element additions.

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