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Attainments and Challenges of High Temperature Oxidation Resistance of Refractory High Entropy Alloys: Literature Review and Own Results

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Refractory High Entropy Alloys (RHEA) are considered novel promising high temperature materials for structural applications at ultra-high temperatures primarily due to their attractive mechanical properties. While many RHEA suffer from poor oxidation resistance similar to that of pure refractory metals, some RHEA exhibit very good protectiveness which is attributed to the formation of either well-known protective scales such as α -Al₂O₃, or rarely encountered complex oxides such as CrTa-based oxides. In this contribution, the currently available literature on high temperature oxidation behavior of RHEA is reviewed with respect to the oxidation kinetics as well as oxide scale growth and constitution. In addition, own results on the formation and growth of complex CrTa-based oxides, which exhibit high thermodynamic stability and slow growth kinetics, are presented.

Category

Solid State (Experiment)

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