



New Developments in Dispersion Strengthening of Metals and Alloys

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Message from the Guest Editor

Dispersion strengthening is one of the most important strengthening mechanisms effective at very high temperatures, up to 80 to 90 per cent of the melting point of the base alloy. It involves the addition of extremely small (few nm), hard, thermally stable and uniformly dispersed particles in the matrix, generally in the form of refractory oxides, carbides or nitrides. These fine precipitates restrict the movement of dislocations and minimize grain- and subgrain-boundary sliding even at high temperatures and, therefore, enhance the strength and creep resistance. They can also provide a combination of high oxidation and hot corrosion resistance and high stability under neutron irradiation, limiting swelling.

The aim of this Special Issue is to cover a wide range of topics that may include: manufacturing, joining, microstructure characterization, testing under extreme environments, economical and industrial aspects of the Materials including steels, superalloys, aluminium, titanium or copper alloys, refractory alloys (tungsten, molybdenum).

Both numerical and experimental contributions, including approaches to overcome current limitations of these alloys will be welcomed.





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Message from the Editorial Board

Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

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