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Editorial

High-Entropy Alloys

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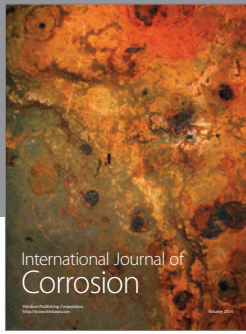
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High-entropy alloys are usually defined as metallic materials with high entropy of mixing at their disordered state. They tend to form high-entropy disordered solid solutions and amorphous phases and get simpler microstructure. High-entropy alloys can include disordered solid solution alloys and high-entropy metallic glasses. In addition, high-entropy ceramics based on the same “high entropy” concept can include carbides, nitrides, borides, and oxides. Recent advances in high-entropy alloys and ceramics have brought new conceptions to develop advanced materials, which may potentially overcome the challenges in increasing the property limits for the advanced energy and environment friendly materials. Knowledge and understanding of these high-entropy alloys and ceramics have led to the usage of novel tools for more detailed study such as serration and crackling noise detection, high energy X-rays synchrotron, neutron diffraction, focus ion beam (FIB), 3-dimensional atomic probe tomography (3D APT), density functional theory modeling (DFT), CALPHAD, and ab initio molecular dynamics (AIMD) modeling.

In this special issue, investigators contribute original research articles as well as review articles that will stimulate the continuing efforts to understand the structure, phase formation rules, thermodynamics, kinetics, processing, and properties underlying the development strategies and the evaluation of outcomes. We are particularly interested in articles describing the new technologies applied for fabricating the materials and characterizing the structural change in the micro- and nanoscale by in situ observations.

The following areas are covered in this special issue: recent developments in high-entropy alloys, ceramics, and amorphous alloys; advances in mechanical and physical behaviors of high-entropy alloys; latest technologies for fabricating and characterizing high-entropy alloys; and serration behaviors and crackling noise of advanced materials.

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