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TMS 2018

147th Annual Meeting & Exhibition

MARCH 11 – 15, 2018
PHOENIX, ARIZONA

SUBMIT AN ABSTRACT TO:

NANOSTRUCTURED MATERIALS

THERMAL AND MECHANICAL STABILITY OF NANOCRYSTALLINE MATERIALS

Nanocrystalline materials exhibit a wide range of desirable properties arising from the high density of internal interfaces. However, the energetic penalty associated with those very interfaces often drives rapid grain boundary migration and grain coarsening, which results in a degradation of the material properties. A great deal of recent work has focused on understanding the fundamental aspects of grain boundary stability by linking the local chemistry and structure of grain boundaries to their behaviors under such conditions as elevated temperatures and mechanical loading. A fundamental understanding of interface stabilization and its implications for technologically relevant properties will ultimately inform engineering strategies to design high-performance nanostructured materials.

This symposium aims to discuss interface-driven physics that govern nanostructure stability, including both thermodynamic and kinetic effects in nanocrystalline materials. Talks are solicited that cover fundamental and applied aspects of nanostructure design and stability from the nano to macroscales, and across experimental, theoretical, and computational modeling disciplines. Also of interest for this symposium are presentations on non-equilibrium processing, thermal and mechanical stability, and technological applications of nanostructured materials.

Topics of interest include:

- Influences of grain boundary character and local chemistry on grain boundary mobility
- Formation of grain boundary complexions and their thermal/mechanical stability
- Investigations of grain boundary structure-property relationships
- Thermodynamic modeling of nanostructure stability
- Synergistic thermodynamic and kinetic effects in stabilizing nanomaterials
- Processing and applications of stabilized nanostructured materials
- Thermal stability studies for extreme environment applications
- Mechanically coupled grain boundary migration and coarsening
- Radiation-induced coarsening

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