

PROCEEDINGS

Exploration of Alloy Composition-Phase Relationships: High-Throughput Experimental Concepts and Approaches

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ABSTRACT

The Materials Genome Engineering (MGE) spurs the developments and applications of methods and tools in high-throughput experiments, integrated computation materials engineering and big data. Due to the unique importance and characteristics of structural alloys, there are great needs for MGE high throughput experimental methods and tools to enable efficient establishment of the complex alloy composition-microstructures-property relationships. To explore the alloy composition-phase relationships, several high-throughput experimental concepts are discussed. The diffusion-based high-throughput experimental concepts and approaches are highlighted from generating composition spread, automating characterization, and to illustrating systematic analysis. In particular, the evolution of diffusion multiple concepts and approaches demonstrated its efficiency, reliability and vitality to the high-throughput experimental methods and to the MGE at large.

KEYWORDS

Diffusion multiple; high-throughput experiment; composition-phase relationship; materials genome engineering

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