Poster Session | F. From Microstructure to Properties: Mechanisms, Microstructure, Manufacturing

[PO-F1]Poster Session 1

Symposium F

Mon. Oct 29, 2018 5:45 PM - 8:00 PM Poster Hall

[P1-48]Phase field simulation of the phase separation in the TiC-ZrC-WC system

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TiC-ZrC-WC system with high hardness is a promising material being widely used in industries like processing and manufacturing. Understanding the microstructural evolution and the mechanism during phase separation process is still a formidable challenge nowadays. Microstructural evolution mechanisms during phase separation process are explained for the first time through the methodology combing our CALPHAD data and two-dimensional Cahn-Hilliard/elastic strain energy model, and we used the parameters in our database of thermodynamics and dynamics. We investigate the effect of elastic strain on lamellar structure, agreeing well with previous results in terms of the variation of the periodicity of the distribution of element composition and the periodicity of regularly lamellar microstructures. It is obvious that phase field method coupled with thermodynamic database is a useful approach to study the microstructure evolution of TiC-ZrC-WC materials and in further speed up the research and development of new materials of TiC-ZrC-WC system.

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