



SEMINAR

Thursday, 28.11.2019 at 10:00

Kolar's lecture hall

σ -phase precipitation in an off-equiatomic $\text{Cr}_{26}\text{Mn}_{20}\text{Fe}_{20}\text{Co}_{20}\text{Ni}_{14}$ compositionally complex alloy

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ABSTRACT

Phase stability of high entropy alloys in the Cr-Mn-Fe-Co-Ni system has received considerable attention. Nevertheless, the knowledge about their thermodynamic equilibrium states and precipitation kinetics during high temperature exposure is still limited. In the present study, an off-equiatomic $\text{Cr}_{26}\text{Mn}_{20}\text{Fe}_{20}\text{Co}_{20}\text{Ni}_{14}$ high entropy alloy was solutionized and isothermally aged at temperatures between 600°C and 1000°C for times up to 1000 h. In the original single-phase fcc matrix, an intermetallic σ -phase was found to form at all investigated temperatures. Its surface area fraction, the amount and size of the precipitates and their chemical composition were determined. Interestingly, in a very narrow annealing time and temperature window its morphology takes a form of 50 nm thin plates lined along {111} planes.

Kindly invited.