

Microstructure of High-Entropy Alloys

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Abstract. In conventional alloys, additional alloying elements are added to the primary (major) element to improve their mechanical, chemical, and physical properties. Since 2018, there has been an increase in interest in high-entropy alloys (HEA) which consist of up to five elements. The multi-dimensional compositional space that can be tackled with this approach is practically limitless, and only several types of HEA have been investigated so far. Nevertheless, some HEA have already been shown to possess exceptional properties, exceeding those of conventional alloys. Other outstanding HEA are likely to be discovered in the future. In this work, we analysed mainly microstructural properties of high-entropy alloy Fe₂₀Co₂₀Ni₂₀Al₂₀Mn₂₀. In doing so, less common approach, which makes use of the Mössbauer effect, was adopted. Bulk of the sample was studied by transmission Mössbauer spectroscopy. The composition of HEA was verified using energy dispersive X-ray fluorescence, chemical analysis (F-AAS), and particle-induced X-ray emission technique.