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High entropy CoCrNiFe-X alloys prepared by mechanical alloying

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High entropy alloys (HEAs) have been the most studied group of materials in recent years. HEAs are usually composed of five or more principal elements whose concentration varies from 5–35%. These alloys exhibit exceptional mechanical properties, including high strength and plasticity and good corrosion and wear resistance. They are typically characterized by four effects comprising the high entropy effect, the lattice distortion effect, the sluggish effect and the cocktail effect. Up to this time, HEAs have been produced mainly by traditional melt-metallurgy processes especially by arc or induction melting, followed by the final processing techniques to achieve desired microstructure, mechanical properties and shape. Current researches have been focused on powder metallurgy routes combining mechanical alloying and appropriate compaction technique that may mitigate the undesirable microstructural coarsening. In this work, equiatomic CoCrNiFe-X (X-Mn, Nb) alloy was prepared by a combination of mechanical alloying and spark plasma sintering. Further, the same alloy was also prepared by conventional induction melting for comparison. The effect of sintering temperature and of the preparation on microstructure and mechanical properties was studied.

Biography

Andrea Skolakova has studied as a PhD student at the Department of Metals and Corrosion Engineering of University of Chemistry and Technology, Prague (UCT Prague). She was awarded by prestigious Votocek's stipend associated with publication activity that is granted to the most talented students. She is an author and co-author more than 25 papers indexed by Web of Science and Scopus.

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