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Microstructure of high entropy alloy: CoCuFeNi[1] PHILLIP SPRUNGER, Louisiana State Univ - Baton Rouge, DAVID PLAISANCE, Louisiana Tech University, BOLIANG ZHANG, Department of Mechanical and Industrial Engineering, Louisiana State Univ - Baton Rouge, AMITAVA ROY, Center for Advanced Microstructures and Devices, Louisiana State University, SHENGMIN GUO, Department of Mechanical and Industrial Engineering, Louisiana State Univ - Baton Rouge — The properties of CoCrFeNi powder alloy were prepared by ball milling methods were investigated and compared to arc melted samples. The electronic and microstructural properties of this high entropy alloy (HEA) were investigated via X-ray powder diffraction (XRD), as well as X-ray absorption near-edge structure (XANES) and extended X-ray absorption fine structure (EXAFS) spectroscopy, X-ray and VUV photoemission (PES) spectroscopy. XRD reveals a single-phase fcc structure with a lattice constant consistent with previous studies from arc-melting preparation method. XANES reveals subtle changes in metallic edge structure compared to single-phase elemental samples. Moreover, in spite of EXAFS limited energy range of these *3d* transition metals, generated χ(k) and corresponding Fourier transforms of this solid solution HEA alloy reveals that the nearest neighbor distances are nearly equal for all four elements (Co, Cr, Fe, and Ni), although subtle differences from bulk phase are observed. XPS and PES results of surface properties, and relevance to corrosion resistance, will also be presented.

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