Phase Equilibria in the Co-Fe-Si Ternary System using Synchrotron Powder Diffraction
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The Co-Fe-Si system was investigated using synchrotron x-ray diffraction data obtained from the Advanced Photon Source at the Argonne National Laboratory. New phase equilibria were observed at 1160 degrees Celsius and 800 degrees Celsius. Of particular note was the observation of a Co2FeSi \(L_2_1\) structured Heusler type intermetallic phase, consistent with single composition work in the literature but contrary to the published phase diagrams. We present revised isothermal sections generated using SEM-EDS and powder diffraction data analysed with GSAS-II refinement software. High brilliance, high energy diffraction enabled observation of low-angle superlattice peaks where traditional Cu K\(\alpha\) radiation would produce a high fluorescence background.