Structural study of nanostructured Cr-Co based alloys by X-ray diffraction line profile analysis

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Abstract:

This work reports on the X-ray diffraction profile analysis by the Rietveld method of Cr-Co based alloys obtained by ball milling. The procedure consists in modeling the diffraction profiles by analytical functions. Using MAUD software [1], the estimation of the average crystallite size, the microstrains and the dislocation density is derived from the isotropic model [2] where the experimental profiles are fitted with a pseudo-Voigt analytical function. The stacking faults, namely intrinsic, extrinsic and twin faults are estimated applying the Warren model [3]. This investigation may significantly help to understand the processing of Co-Cr based alloys which are known to have potential applications in biomedical engineering.


Keywords: X-ray diffraction; Rietveld refinement; nanostructures; defects.