

Abstract The concept of high entropy alloys is defined as alloys containing multi elements in equiatomic or near equiatomic ratio. Since their development during the past decade, attention has been paid to high entropy alloys in the materials research field due to their high strength and hardness, wear and corrosion resistance. Nanocrystalline equiatomic high – entropy alloys have been synthesized through mechanical alloying in the AlCrFeMnNi system. The effect of milling time on the structural modification was investigated. The stability of the solid solution phases depending on the milling time was analysed by X-ray diffraction and electron microscopy with EDAX analysis. The simple solid structure was obtained after 10 hour milling and the grain size may be less than 50 nm. AlCrFeMnNi processed by mechanical alloying will be used for designing hot rolling mill due to the fact that present a high microhardness and high wear and corrosion resistance in comparison with materials used nowadays.