

## **Study of hydrogen diffusion in nanocrystalline equimolar CoCrFeMnNi High Entropy Alloy after severe plastic deformation**

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High Entropy Alloys have a lot of crystalline structures, microstructures and properties. They can also show high resistance to wear, high hardness and resistance to compression at high temperatures and good resistance to corrosion. High Entropy Alloys can have one or more phases. The alloys can also show a low diffusion, this stabilizes thermally the microstructure. The aim of this work is to evaluate the hydrogen diffusion in a HEA micro and nanocrystalline. The alloy CoCrFeMnNi was melted in an arc melt furnace, and then was annealed at 900°C, of this total, half was cold rolled at 50% and 70% and the other half was submitted to High Pressure Process (HPT). The analysis used was X-ray diffraction, Scanning Electron Microscopy, Transmission Electron Microscopy and Hydrogen gas permeation. The alloy shows a single phase FCC. The HPT process became the material nanocrystalline and the hydrogen diffusion was slow after HPT process.

Key words: High Entropy Alloys, Nanocrystalline, Hydrogen diffusion