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NanoMed 2019

NanoMedicine International Conference 2019

Since the advent of nanotechnology, there has been a tremendous growth in this field of nano-bio-technology. Many products introduced into the market are based on nano-bio-technology and are useful to environment monitoring, rapid diagnostics, diseases monitoring, diseases management, and personalized health care. The ultimate aim of this approach is to make a better and healthier tomorrow for everybody. **NanoMedicine 2019** will cover the most recent international developments in the field of Nanobiotechnology and Nanomedicine. Participants will get a complete overview on the state of the art in these fields and on the research carried out and the latest results. Recent advances, difficulties and breakthroughs as well as emerging and future trends of the converging fields of Nanotechnology, Biotechnology and Medicine will be discussed. The event offers to the participants from both science and industry the opportunity to discuss new cooperation projects.

Effects of Nickel Content on the Microstructure, Microhardness and Corrosion Behavior of High-entropy AlCoCrFeNi_x Alloys

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Abstract:

The pioneering efforts in obtaining the high entropy alloys (HEAs) created the groundwork for a new concept in alloy design by finding new equiatomic combinations of elements for advanced materials with unique properties.

In this study we investigate the effect of different nickel concentration on the microstructure, hardness and corrosion properties of high entropy alloys from AlCrFeCoNi system.

The analyzed HEAs were AlCrFeCoNi_x with $x=1$; 1.4 and 1.8. These alloys were obtained by vacuum arc remelting from raw materials with high purity.

The microscopy examination has revealed the dendritic morphology for the reference alloy (AlCrFeCoNi) and the increase of the width of the interdendritic zones by increasing the nickel concentration while Cr is segregated in the interdendritic regions more than in dendrites.

Hardness values decrease with increasing the percentage of nickel because of the dissolution of precipitates in a nickel rich matrix and in consequence forming continuous solid solutions.

The corrosion properties of the HEAs were evaluated using a potentiodynamic polarization method. The alloys were immersed in SBS (Simulated Body Fluid) during one week and the corrosion parameters were registered. The low corrosion rates, low corrosion currents and high polarization resistance attest the good stability of HEAs in simulated biological environment.

Keywords: high entropy alloys, nickel, corrosion resistance, corrosion currents, polarization resistance, passivation, Ringer solution.

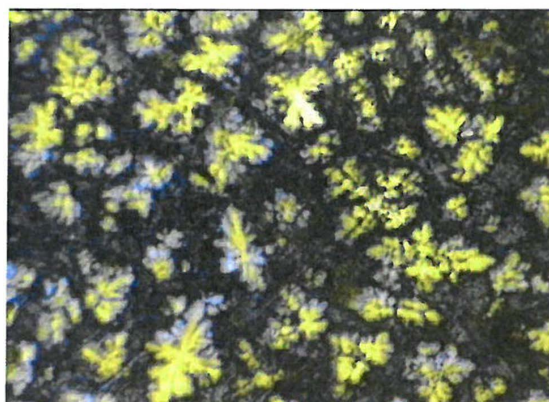


Figure 1: Figure illustrating the dendritic morphology of high-entropy AlCrFeCoNi_{1.4} alloy after electrochemical etching in oxalic acid 10% for one minute.

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