

Electrodeposition of Ni, Fe and Ni-Fe Alloys in Two Ionic Liquids: (tri (n-butyl) [2-methoxy-2-oxoethyl] Ammonium bis (trifluoromethylsulfonyl) [BuGBOEt] [Tf₂N]) and (1-butyl-1-methylpyrrolidinium bis trifluoromethylsulfonyl) imide ([P_{1,4}] [Tf₂N])

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Ni, Fe and Ni-Fe alloys electrodeposition were tested in two ionic liquids. The first one is a commercial (1-butyl-1-methylpyrrolidinium bis(trifluoromethylsulfonyl)imide ([P_{1,4}][Tf₂N])) and the second is a homemade (tri(n-butyl)[2-ethoxy-2oxoethyl]ammonium bis (trifluoromethylsulfonyl)imide([BuGBOEt][Tf₂N])). Covering iron deposits was obtained in the [BuGBOEt][Tf₂N]. Nickel deposition was only possible in the [P_{1,4}][Tf₂N]. Ni-Fe alloys were obtained from the [P_{1,4}][Tf₂N] solvent. The study of the evolution of alloys composition versus polarisation shows irregular evolution depending on the applied potential. The alloys composition varies approximately between Ni₇₀-Fe₃₀ and Ni₉₀-Fe₁₀ for applied potentials including to - 1.8 V and - 4 V versus Ni electrode. The chemical composition, the surface morphology and the structure, of deposits were characterized by scanning electron microscopy (SEM), energy dispersive analysis (EDX) and X-ray diffraction (XRD).

Keywords: Fe; Ni; Ni-Fe alloys; Electrodeposition; Ionic liquids

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