

Electrodeposition of Neodymium in Room Temperature Ionic Liquid Electrolyte

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Electrodeposition of electronegative metals, such as those from lanthanide series of elements, requires the use of hydrogen ion free (non-aqueous) electrolyte solutions. This precondition is met by using the so called room temperature ionic liquids, as the relatively new class of electrolytes. In this research, the electrodeposition of neodymium was studied in 1-Butyl-1-methylpyrrolidinium bis(trifluoromethylsulfonyl)imide (BMP-TFSI). The electrochemistry was studied by using the rotating disk technique, in which the working electrode was Pt and respective counter and reference electrodes were graphite and silver/silver chloride. Cyclic voltammetry and chronoamperometry were the primary electrochemical techniques. The parameters studied were the effect of scanning potential range, scanning rate, cathodic and anodic vertex potentials. The role of absorbed water and the presence of alcohols (ethanol), was also examined. The rotation speed parameter was of importance for calculation of reaction rate and mass transfer rate constants. The electrode surface characterization was performed by using optical and scanning electron microscopy.

Biography:

Batric Pesic is a Distinguished Professor (teaching) at the University of Idaho. He has received BS degree in metallurgical engineering from University of Belgrade-Campus Bor; MS (1976) and PhD (1982) from University of Utah, USA. Upon graduation, Dr. Pesic moved to Canada and worked for H.B.M.S., Flin Flon, Manitoba. In 1983, he returned to the USA to join the University of Idaho. His research interests have been, initially in extractive metallurgy, followed by environmental subjects. Most current research is in electrochemistry in molten salts. He has extensive consulting experience with major chemical and metallurgical corporations in North America, Europe, and Africa.