**ABSTRACT**

The effect of Niobium (Nb) on charge-discharge behaviour of Mg67Ni(33-x)Nbx (x= 0, 1, 2 and 4) alloys synthesized by high energy ball milling was examined using electrochemical method. Mg67Ni33 alloys with varying Nb concentration has been synthesized and characterized by various characterization techniques viz., XRD and SEM (EDS) etc. XRD pattern of the synthesized alloys reveal the formation of Mg2Ni intermetallic with NbO2 oxide on the surface of Mg2Ni compound, which prevents the corrosive nature of electrode material. However, the stable oxide film formed on the surface of Mg2Ni compound decreases the electrochemical properties of the electrode i.e., diffusion of hydrogen and discharge capacity which is due to the passivation nature of the oxide film.