Conference Paper – Volume 1010 MSF, Materials Science Forum Series 2020, Pages 280 – 285

Effect of h2/n2 mixtures on reduction of nickel oxide

Abstract

This paper describes the reduction of nickel oxide under different gas mixture. The influence of gas mixture on phase, density, morphology and pore size of reduced nickel oxide were studied. Nickel oxide pellets sintered at 1400° C were reduced under various hydrogen-nitrogen gas mixtures, namely 40% H2-60% N2, 60% H2-40% N2, 80% H2-20% N2. Phase identification, density measurement and observation of morphology were conducted on samples before and after reduction process. Under all gas mixtures, nickel oxide was completely reduced to nickel. Density of the samples decreased in the range of 21% to 32% depends on H2 percentage used. Results from the density shows that the higher the H2 gas concentration, the smaller the density changes. Significant change in porosity of the sample before and after reduction was observed. Size of pore after reduction determined by H2 concentration used during reduction where the higher the H2 concentration resulted in large pore size.

Keywords

Anode material; Nickel; Nickel oxide; Reduction; Solid oxide fuel cell