ABSTRACT

Over the last 2-3 decades the consumption of Li-ion batteries has increased due to their high charge density, light weight, and no memory effect. This result in increasing air pollution due to metals like Li, Co, and Ni and also at the same time declining in the amount of these valuable metal so it is required to recycle metals and also prevent the environment from harmful metals. For recycling and separation of valuable components, a hydrometallurgical approach is utilized in which 3M H_2SO_4 and 30% wt. H_2O_2. Is used at 70-80^0 C with continuous stirring. And Li, Co, and Ni were separated at different pH with a chemical approach. For the separation of Ni and Co electrolytic approach is done with cathodes of steel, lead, and copper, and a graphite anode. Both Ni and Co have close reduction potential so an electrical approach is adopted. XRF characterization of chemical and electrolytic shows that Li is separated in chemical separation by the addition of Na_2CO_3 at high temperatures. Ni is 69.71% separated in electrolytic separation. Li content analyzed by Flame photometer separated at different pH was 5.01%, 12.8%, 3.31% at pH 4,7, and 11 respectively and the Li content in the sample of Li_2SO_4 is about 17.13%.