Northern rare earth nickel-metal hydride battery

Can a nickel metal hydride battery be recycled?
Adsorbent Synthesis for recyclable of a Nickel Metal Hydride battery (Ni-MH battery) which contain rare earth elements. Characterization of the synthetic adsorbent. Leaching and precipitation tests of the internal content (positive and negative electrodes) of batteries. Separation and Recovery of Rare Earth Mixture Study.

Who invented the re-use of rare earth metals from nickel-metal hydride batteries?
L.Honda Motor CoHonda established world's first process to reuse rare earth metals extracted from nickel-metal hydride batteries for hybrid vehicles Honda Motor Co.,Ltd. Web page(2013) Google Scholar

How do we recover valuable metals from spent nickel metal hydride vehicle batteries?
Recoveries of valuable metals from spent nickel metal hydride vehicle batteries via sulfation,selective roasting,and water leachingJournal of Sustain Metall,4(2018),pp. 313-325 Google Scholar L.Honda Motor Co

What is the first process to reuse rare earth metals from hydride batteries?
Honda established world's first process to reuse rare earth metals extracted from nickel-metal hydride batteries for hybrid vehicles Honda Motor Co., Ltd. Web page(2013) Google Scholar W.N.Smith, S.Swoffer Process for the recovery of metals from used nickel/metal hydride batteries U.S. Patent No., 8(246)(2012), p. 717 Google Scholar

How to recover Rees from Ni-MH batteries?
Graphical abstract Various techniques have been proposed for the recovery of REEs from Ni-MH batteries,including hydrometallurgical and pyrometallurgical methods. Hydrometallurgical methods involve the extraction and purification of REEs from aqueous media,while in pyrometallurgical methods,REEs are recovered at high temperatures.

How is a NiMH battery anode made?
The process involves the acid leachingof the active material and the recovery of REEs in the forms of oxides. The REEs are then metallized through a molten salt electrolysis process and subsequently reutilized to manufacture NiMH battery anode .

The anode of nickel metal hydride battery contains about 30 wt% of rare earth elements, namely, lanthanum, cerium, praseodymium, and neodymium. These elements are in increasing high demand, but facing supply uncertainty and near zero recycling. Current recycling practices rely on either pyrometallurgy or hydrometallurgy. The former is highly ...

After a brief presentation of the characteristics of spent nickel metal hydride 11 batteries and their composition, this review first describes the physical pretreatment methods, 12 followed by the main principles

and challenges of element separation by pyrometallurgy.

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The experimental research was focused on the investigation of valuable material from spent Ni-MH type AA batteries, namely the metal grid anodes and the black mass material (anode and cathode powder). The materials of interest were analyzed by X-ray fluorescence spectroscopy (XRF), ICP-OES (inductively coupled plasma optical emission spectrometry), ...

The recovery of rare earth elements such as La(III) and Nd(III) from spent nickel-metal hydride (NiMH) battery by novel synthetic adsorbent were investigated. First, layered double hydroxide (LDH)-A (A - anion of carrier) been prepared and characterized by ...

Part 1. Nickel metal hydride battery. Composition. NiMH batteries house a positive electrode composed of nickel oxyhydroxide (NiOOH) and a negative electrode incorporating a hydrogen-absorbing alloy, often made of a mixture of rare earth metals, nickel, and other elements like titanium or zirconium.

Ionic liquids as the environmentally friendly approaches are proposed by various investigations for the extraction of critical metals from spent Ni-MH batteries.

Various techniques have been proposed for the recovery of REEs from Ni-MH batteries, including hydrometallurgical and pyrometallurgical methods. Hydrometallurgical ...

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