

Hitachi develops recycling technologies for rare earth metals

December 16 2010

Hitachi today announced that it has developed technologies for recycling rare earth magnets from hard disk drive (HDD) motors and air conditioners and other compressors. Specifically, developed machinery to separate and collect rare earth magnets from end-of-life products, and successfully extracted rare earths from rare earth magnets using an experimental dry process. Going forward, Hitachi aims to commence full recycling operations by 2013 after calculating overall recycling costs and recovery ratio.

Separating and collecting rare earth magnets from HDDs manually requires approximately five minutes per worker per HDD (roughly 12 units per worker per hour). Hitachi has confirmed that the machinery it has developed is able to run the separation and collection with roughly eightfold increased efficiency (approximately 100 units per hour). In the case of compressors, the separation process was difficult thus far, but the development of new cutting machinery and demagnetizing machinery has made safe, efficient separation and collection possible.

The process of extracting rare earths from separated and collected rare earth magnets has been performed manually using acids and other chemicals, resulting liquid waste disposal that causes issues in terms of cost and environmental conservation. The new dry process, however, extracts rare earths using a special extraction material with high affinity for rare earths. Research is advancing toward the establishment of the dry extracting process that will reduce cost and environmental burden of extraction.

Rare earth magnets are alloyed metals consisting of roughly two thirds of iron and one thirds of rare earth metals, with neodymium added for a stronger magnetic force than the one in ordinary magnets, and dysprosium added to enhance heat resistance. These materials are essential in products that contribute to a low-carbon society such as HDDs used in personal computers and others, IT equipments, high-performance motors for IT factory automation, wind power generators, home appliances like air conditioners that excel in energy-saving performance and motors for hybrid cars. Meanwhile, approximately 97% of rare earth production volume comes from the People's Republic of China, and given as a fact that developing alternative materials is time requiring matter, the recycling of rare earths from rare earth magnets in end-of-life products are expected to secure rare earths stably.

However, the process of separating and collecting rare earth magnets safely from products not only requires a great deal of time and effort but also chemicals for the process of extracting [rare earths](#) resulting liquid waste disposal which creates issues in terms of cost and environmental conservation. Therefore, [Hitachi](#) has been developing rare earth recycling technologies that are safe, efficient, and environmentally conscious.

Source: Hitachi

Citation: Hitachi develops recycling technologies for rare earth metals (2010, December 16) retrieved 26 April 2024 from

<https://phys.org/news/2010-12-hitachi-recycling-technologies-rare-earth.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.