

ACID-FREE DISSOLUTION AND SEPARATION OF RARE-EARTH ELEMENTS AND COBALT

CRITICAL NEED

Rare-earth elements (REEs) are widely used in permanent magnets, lamp phosphors, catalysts, rechargeable batteries and many more technologies critical to supporting a green economy. Cobalt (Co) is also strategic for energy storage, super-alloys, permanent magnets, and ceramic pigmentation. With the potential for disruption in the supply of REEs and Co, scientists have sought ways to recycle them from spent materials. One option pioneered by Ames Laboratory scientists has great promise.

TECHNOLOGY VISION

Ames Laboratory scientists have developed a novel aqueous-based recycling technology which recovers >99.9% pure REE oxides at 98% efficiency. The process selectively leaches REEs from e-wastes and leaves other components in recyclable conditions. It also recovers high purity Co from spent materials.

POTENTIAL IMPACT

The process eliminates the typical use of acids for feedstock dissolution, thus excluding environmental and operational hazards. It applies to multiple feedstock materials and creates valuable by-products. Techno-economic analysis indicates short payback duration.



Critical Materials Institute
AN ENERGY INNOVATION HUB



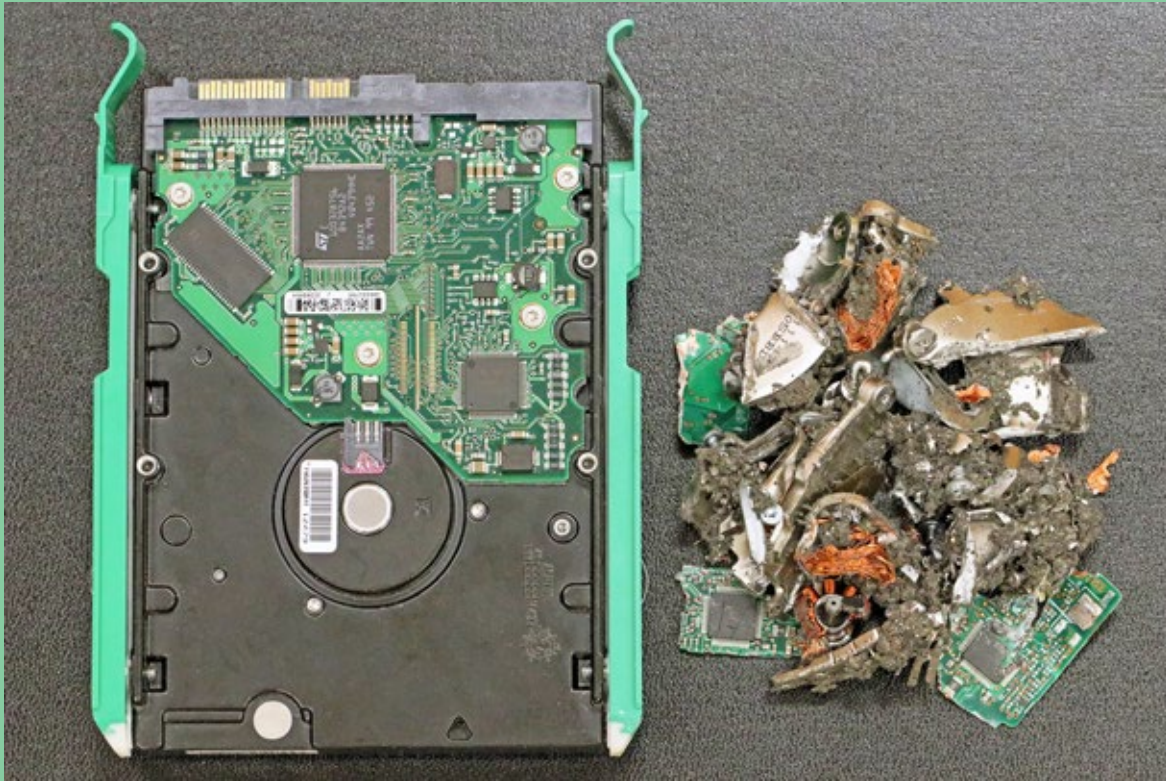
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Creating Materials & Energy Solutions
U.S. DEPARTMENT OF ENERGY



These rare earth elements and cobalt products were recovered from waste magnets, including those contained in electronic waste, via the acid-free dissolution process. Permanent magnets were remade with the recovered rare earth products.

For more information please contact:

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