



Extraction of Rare Earth Elements from Coal and Coal Byproducts

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Patent Status:

Patent Pending

Description of Technology

Lanthanides, or rare earth elements (REEs), have been increasingly used in renewable energy and energy-efficient technologies because of their unique electronic, magnetic, optical, and catalytic properties. Mining and then extracting is the typical way to obtain these REEs, but because they are present in coal and coal combustion byproducts such as fly ash, reports have confirmed the potential for extraction and separation of REEs from the coal and coal byproducts.

Researchers at the University of Wyoming have created an invention that uses either formic or acetic acid to extract the REEs from coal and coal byproducts. Initial experiments show that REEs can be extracted from coal and coal byproducts. University of Wyoming researchers have initial data showing the extraction efficiency of coal (TS) and coal byproducts (FS) (available upon request).

Applications

This invention can be used to add value to otherwise useless materials. Coal can be used for other energy purposes, but when it comes to fly ash, right now it is only used for some concrete applications. Being able to extract RREs out of fly ash would make it a much more valuable product. If this invention were used by a coal burning energy plant, they could have much higher profit margins over what they currently have.

Features & Benefits

- This new method could be used to extract the REEs out of coal and coal byproducts to supplement traditional mining and extraction of REEs.
- This could help to lower the price of REEs.

Fly Ash



<https://www.arthaminerals.com/images/fly-ash-powder-1147679.jpg>

Coal



https://upload.wikimedia.org/wikipedia/commons/7/72/Coal_anthracite.jpg

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