CERIUM, COBALT AND COPPER ALLOY DOPED WITH TANTALUM AND/OR IRON AS A PERMANENT MAGNET MATERIAL

CRITICAL NEED

Permanent magnet technology has advanced significantly to now include four groupings of magnets with increasing magnetic strength and cost. However, gaps exist in performance between the magnet groups, and there's also a strong desire to reduce magnet costs.

TECHNOLOGY VISION

Ames Laboratory scientists have developed a gap magnet family that provides intermediate performance between the four magnet groups but at a price point closer to that of entry level magnets. Scientists are substituting the abundant rare-earth metal cerium (Ce) for less-abundant samarium in high-flux magnets. They've further reduced costs by substituting copper and iron for cobalt in magnets.

POTENTIAL IMPACT

Cerium is the most abundant rare-earth metal and is also one of the cheapest. It is anticipated that higher usage of Ce would help improve profitability for rare-earth mining operations.

CMI Critical Materials Institute
AN ENERGY INNOVATION HUB

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

Paul Canfield
Ames Laboratory scientist

For more information please contact:

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