

UPDATE FROM THE CUTTING EDGE

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The abstracts of the recent research information appearing in Vol.11 No.10-12 of "AIST TODAY" are introduced here, classified by research areas. For inquiry about the full article, please contact the author via e-mail.

Environment and Energy

A method to separate each rare earth phosphor from the mixture of phosphors

A continuous and low-cost separation by using a high field gradient separation method

We have developed a method to separate phosphor waste which is a mixture of several kinds of phosphors into each species of phosphor by using a high magnetic field gradient separation method. Measurement of magnetic susceptibility of phosphors revealed that each phosphor has different magnetic susceptibility. Green phosphor, $\text{LaPO}_4: \text{Ce, Tb}$ (LAP), shows one order of magnitude higher magnetic susceptibility than other phosphors. By choosing an appropriate dispersant and optimizing operation procedure, the efficiency for the separation was increased. As a result, LAP was recovered as a magnetic product in the separation column with above 80 % of the concentration by one step separation. It was also confirmed that separation of other phosphors having smaller difference in magnetic susceptibility could be achieved.

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Phosphors of different color luminescence separated (red, blue, green from the left of bottom row) from tri-color phosphor mixture exhibiting white luminescence (upper row)

