

Topic:

Separation of Rare Earth Metals

Abstract:

Contrary to the name, rare earth elements (REEs) are not rare at all. Because of their special properties, they are widely applied in catalysts industry, magnetic materials, fuel cells, and so on. However, due to similar chemical properties, these metals usually coexist with each other, as well as other transition metals in nature, and are extremely difficult to separate. Many applications have been limited by the high cost associated from separation of these metals. Cost-effective, as well as efficient, separation methods are thus very important for applications of rare earth metals. Ionic exchange and solvent extraction are the two principle means used currently for rare earth metal separation. In this talk, I will discuss recent research using these traditional methods to separate REEs. In one project, layered double hydroxides (LDHS) has been used to extract Lanthanum and Neodymium from Nickel-metal-hydride batteries,^[1] while in another work, people succeeded in separating heavy REEs by adopting extraction chromatography.^[2] Besides these traditional methods, some novel methods are also being explored. I will discuss one such example of next generation researchers who managed to separate REEs by a low molecular weight DNA filter into several groups, based on the fact that different REEs have varying degrees of adsorption on DNA.^[3]

Key Words: Rare Earth Elements, Separation, Ionic Exchange, Solvent Extraction

Reference:

[1] M.S. Gasser, M.I. Aly, *International Journal of Mineral Processing* **121** (2013) 31–38

[2] Jeong-Gon Kim, *Current Nanoscience*, **2014**, Vol. 10, No. 1

[3] Yoshio Takahashi *et al*, *ANALYTICAL SCIENCES*, October 2012, Vol. 28