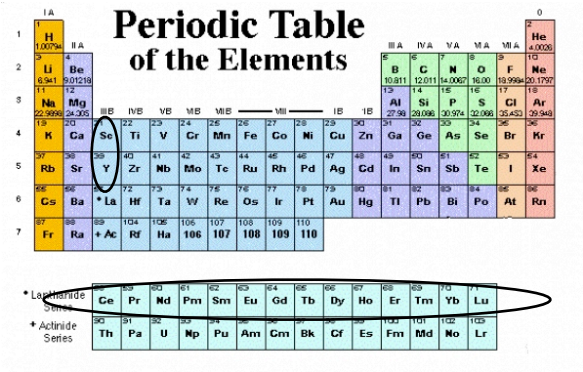
Rare Earth Element Crisis

Rare Earth Elements are an important component in the production of energy efficient fluorescent lamps. As a result of the escalating supply and increasing demand pressures, Rare Earth prices for these obscure elements (China supplies > 95%) have risen dramatically within the last 12 months and continue to show signs of escalation into the future.

What are Rare Earth Elements?

- Rare Earth Elements are a group of chemically similar elements know as lanthanides along with scandium and yttrium.

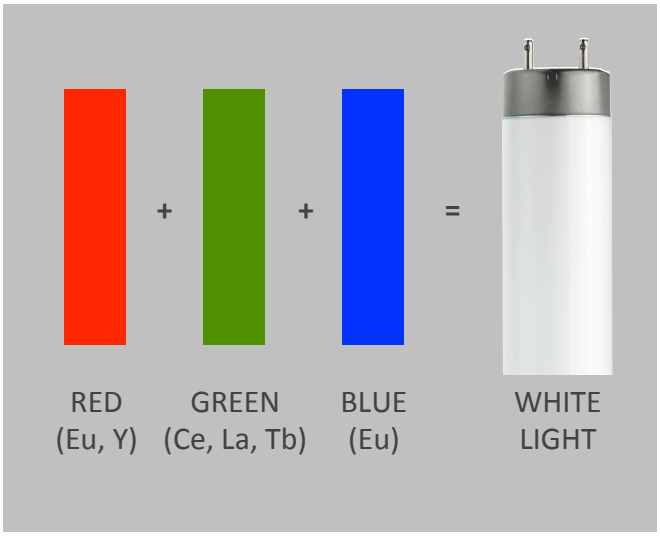
- Rare Earth Elements are used in the production of many different products:
  - Hybrid Cars
  - Wind Turbines
  - Solar Panels
  - Military Weapons
  - Smart Phones
  - Computers
  - Flat Screens
  - **Fluorescent Lighting**



Where are Rare Earth Elements used in Fluorescent Lighting?

- Fluorescents contain Halo and Tri-Phosphors
  - Tri-Phosphors use Rare Earth Elements in their Phosphor mix
  - Rare Earth Elements are vital components in energy efficient Fluorescent Lamps

- Tri-Phosphors are used in the following:
  - T8 Fluorescent Lamps
  - T12 Fluorescent Lamps
  - T5 Fluorescent Lamps
  - Compact Fluorescent Lamps
  - any many other Fluorescents



Cerium, Europium, Terbium, and Yttrium, are examples of Rare Earth Elements contained in Fluorescent Lamps.

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Rare Earth Element Mining

- China Produces 97% of Rare Earth Elements
  - uses 60% to support themselves

Why are prices for Rare Earth from China rising?

- Reduced annual exports to the world to protect supplies for their own growing industries
- New tax and tariffs imposed by Chinese government
- New mining rules and regulations enforced by Chinese government

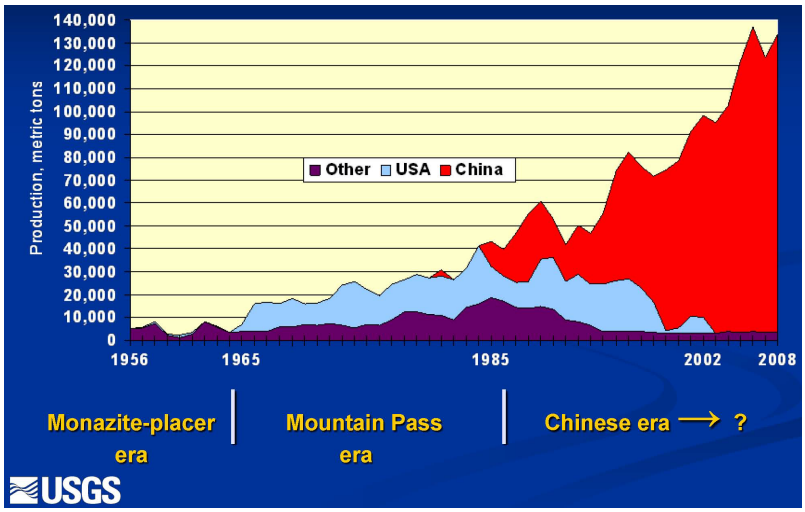

Figure 1. Global rare-earth-oxide production trends. The Mountain Pass deposit is in California, U.S.A. Graph from D.J. Cordier (U.S. Geological Survey, written commun., 2011) was updated from Haxel and others (2002, fig. 1).

As a result of the escalating supply and increasing demand pressures, Rare Earth prices for these obscure elements have risen dramatically within the last 12 months and continue to show signs of escalation into the future. While the U.S. is trying to counter with domestic mining, costs are high and the process is lengthy.

"Chinese rare earth materials prices soar"
FINANCIAL TIMES, Leslie Hook - May 26, 2011

For more information contact your Voss Lighting Representative.

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