

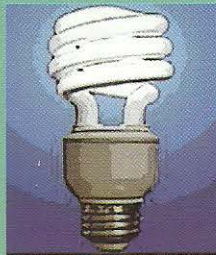
# Four Rare Earth Elements That Will Only Get More Important



Rare earth elements are neither rare, nor earth and they tend to be things that are added, in small doses, to composites and alloys. Rare earths have really unique chemical and physical properties that allow them to interact with other elements and get results that neither element could get on its own. Rare earth elements are crucial to the way we live now; responsible for miniaturizing computers and headphones, powering hybrid cars and more. Rare earth elements—a set of 17 related metals, mostly shunted off to a tacked-on lower line of the periodic table—are crucial to the way we live now; responsible for miniaturizing computers and headphones, powering hybrid cars and more. The time has come to get better acquainted with the molecules that make our modern world run.

## [2] Europium

Europium was the first isolated, high purity rare earth element to enter the public marketplace, in 1967, as a source of the color red in TV sets. There had been color TV before europium, but the color quality was weak. Today, most europium is used in white LED-based lights, which could someday be an energy efficient replacement for both incandescent and compact fluorescent bulbs.

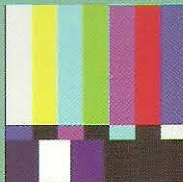


## [1] Lanthanum

Lanthanum, first discovered in 1893, is the second most abundant rare earth element. Today, every hybrid car on the road carries with it about 10 pounds of lanthanum. The car's battery is referred to as "nickel-metal hydride." The "metal" in question is lanthanum. They are about twice as efficient as the standard lead-acid car battery.

## [3] Erbium

The applications of erbium are both deeply important, and a little silly. For instance, adding erbium to glass is about the only way to create a stable pink shade. So erbium-doped glass pops up in novelty sunglasses and decorator vases. A little erbium added to the optical fibers that carry data in the form of light pulses cause those pulses to get amplified. It can also be used as part of the gain medium that amplifies light in a laser which can be used for dental surgery and skin treatments because it does not build up much heat in the human skin it is pointed at.



## [4] Neodymium

In the late '70s, Sony introduced the Walkman, a (relatively) small, (relatively) portable music player. The key is magnets made from the rare earth element samarium, which were smaller and stronger than anything available then. Today, the samarium-based magnets have largely been replaced by neodymium magnets, which are even smaller and even stronger.

They are also used in turbines that turn wind into electricity, and the drills that search for oil deep below the surface of the Earth.