

USES FOR LIGHT RARE EARTH MINERALS

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<http://www.webelements.com/>

Metal	Uses
Lanthanum	<ul style="list-style-type: none"> • rare-earth compounds containing lanthanum are extensively used in carbon lighting applications, especially by the motion picture industry for studio lighting and projection • ²⁰³La improves the alkali resistance of glass, and is used in making special optical glasses • small amounts as an additive are used to produce nodular cast iron • hydrogen sponge alloys containing lanthanum reversibly take up to 400 times their own volume of hydrogen gas. Heat is released, therefore these alloys have potential in energy conservation systems • lighter flints • alloys
Cerium	<ul style="list-style-type: none"> • component of misch metal, used in the manufacture of pyrophoric alloys for cigarette lighters, etc. • the oxide is an important constituent of incandescent gas mantles and is a catalyst in "self-cleaning" ovens. In this application it is incorporated into oven walls to prevent the collection of cooking residues • the sulphate is used extensively as a volumetric oxidizing agent in quantitative analysis • used in the manufacture of glass, both as a component and as a decolourizer • the oxide is used as a glass polishing agent instead of rouge, as it is much faster at polishing glass surfaces • used in carbon-arc lighting with other rare-earth elements, especially in the motion picture industry • used as a catalyst in petroleum refining • metallurgical and nuclear applications

Metal	Uses
Praseodymium	<ul style="list-style-type: none"> • used as a core material for carbon arc lights used by the motion picture industry • salts used to color glasses and enamels; when mixed with certain other materials, praseodymium produces an intense clean yellow color in glass. Component of didymium glass which is a colorant for welder's goggles • Misch metal, used in making cigarette lighters, contains about 5% praseodymium metal • alloys
Neodymium	<ul style="list-style-type: none"> • component of didymium used for coloring glass to make welder's goggles • colors glass delicate shades ranging from pure violet through wine-red and warm gray. Light transmitted through such glass shows unusually sharp absorption bands. The glass is used in astronomical work to produce sharp bands by which spectral lines may be calibrated. Glass containing neodymium is a laser material in place of ruby to produce coherent light • salts are used as a colorant for enamels • alloys • used in astronomy to calibrate spectral lines • lasers (to produce coherent light) • neodymium is used in very powerful permanent magnets - $Nd_2Fe_{14}B$. They are cheaper than samarium cobalt magnets
Promethium	<ul style="list-style-type: none"> • shows promise as a portable X-ray unit • possibly useful as a heat source to provide auxiliary power for space probes and satellites • thickness gauges • used to convert light into electrical current

Metal	Uses
Samarium	<ul style="list-style-type: none"> • carbon-arc lighting for the motion picture industry • SmCo_5 used a permanent magnet material with one of the highest resistances to demagnetization known • used to dope CaF_2 crystals for use in optical masers or lasers • compounds act as sensitizers for phosphors excited in the infrared • the oxide is catalytic for the dehydration and dehydrogenation of ethanol • alloys • headphones • absorber in nuclear reactors
Europium	<ul style="list-style-type: none"> • europium isotopes are good neutron absorbers and are used in nuclear control applications • the oxide is used as a phosphor activator and europium-activated yttrium vanadate is used as the red phosphor in color TV tubes • europium-doped plastic is a laser material • alloys