

# Lead Encyclopedia Article

## Lead

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# Lead

Lead (Pb) is a relatively common element in Earth crustal materials. Lead is a heavy, soft metal that is a solid at normal atmospheric and crustal pressures. Lead is reactive with **oxygen** and tarnishes and dulls when in contact with oxygen. Lead is not a good conductor of **electricity**, heat, sound, or other pressure vibrations.

Lead is found in Earth's **crust** at an abundance of about 13–20 parts per million. It rarely occurs as a free element, and is found most commonly as a compound in the form of galena (lead sulfide;  $\text{PbS}$ ), anglesite (lead sulfate;  $\text{PbSO}_4$ ), cerussite (lead carbonate;  $\text{PbCO}_3$ ), and mimetite. Geochemically, lead is a moderately active metal that dissolves very slowly in **water**.

Lead is both ductile and malleable. These properties allow lead to be easily bent, cut, pulled, or otherwise worked to produce specific shapes. The **melting** point of lead is  $621.3^\circ\text{F}$  ( $327.4^\circ\text{C}$ ), its boiling point is about  $3,180^\circ\text{F}$  ( $1,749^\circ\text{C}$ ), and its density is 11.34 grams per cubic centimeter.

The largest producers of lead in the world are **Australia**, China, the United States, Peru, Canada, Mexico, and Sweden. In the United States, more than 90% of all the lead produced comes from a single state, Missouri. Lead is extracted from its ores by first converting the ore to lead oxide and then heating the oxide with charcoal (pure **carbon**). The lead produced by this process is usually not very pure and can be further refined electrolytically.

Over the past decades, evidence has mounted indicating lead as a significant environmental hazard. Low levels of lead in products (e.g., paint) can accumulate in tissues over time. As a result, many manufactured items (e.g., batteries) now have or seek lead substitutes or provide for contained disposal.

## See Also

Chemical Elements; Minerals