

Malleability Encyclopedia Article

Malleability

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Contents

Malleability Encyclopedia Article.....	1
Contents.....	2
Malleability.....	3

Malleability

Malleability is one of several general physical properties of **metals** and metallic compounds. Chemically, elements can be classified as metals, metalloids, or non-metals based, in part, upon these physical properties. Malleability is the ease with which a metal can be hammered, forged, pressed, or rolled into thin sheets. Different metals vary in malleability. For example, **lead** is highly malleable and can be hammered flat easily. **Iron** requires considerably more effort to pound into a sheet and is therefore less malleable. Yet, both are metals. In contrast, non-metallic elements, such as **carbon** or **sulfur**, shatter into pieces when hammered. Malleability is a valuable property because it allows metals to be shaped into useful forms. Pure **gold** is the most malleable metal. **Silver**, **aluminum**, lead, **tin**, and **copper** are also very malleable. Heating usually increases malleability. For instance, **zinc**, at standard temperatures is brittle, but becomes malleable at temperatures between 248°F (120°C) and 302°F (150°C). Also, impurities can adversely affect the malleability of metals, making them less pliable.

While some metals can have radically different properties overall (gold and **calcium**, for example), by definition all metals share some physical properties which help define their chemical identities. These include: high **electrical conductivity** (the ability to carry an electric charge), high thermal conductivity (the ability to transfer heat), varying degrees of luster (the ability to reflect light), **ductility** (the ability to be stretched into a wire), and malleability. Like other metallic properties, malleability is due to the loosely held electrons in a metal, which allow the metal atoms to slide past one another without experiencing the strongly repulsive forces that would shatter them.