Description of Metals

A solid is considered to be a metal if it has high electrical and thermal conductivity. The chemical definition of a metal also includes having a characteristic surface luster or shine. It is characteristic of metals that they are malleable (can be hammered into sheets) and ductile (can be drawn into wires). A glance at the periodic table will show you that the majority of pure elements are metals. All metals except mercury are solids at room temperature.

Both the high electrical conductivity and thermal conductivity come from the fact that one or more valence electrons is relatively free to travel throughout the solid material. This connection is formalized in the Wiedemann-Franz law.

The microscopic properties of metals are often stated in terms of their Fermi energy and their free electron density.

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