

Name : ----- Date : -----

Metallic Bonds Worksheet

Answers

Answer the following questions.

a. How do metallic ions differ from those in ionic solids?

The ions in an ionic solid are fixed in a rigid structure, with the cations and anions unable to move. In a metal lattice, the ions can move freely, and the electrons are delocalized over a large area.

b. How is a metal lattice held together?

The “sea” of delocalized electrons moving about holds the metal ions within the solid.

c. Name 5 properties of a metal lattice that can be attributed to metallic bonding.

- Malleability - Due to the free-flowing motion of the electrons within the lattice, the overall structure remains flexible.
- Ductility - As the structure of the lattice is malleable, it is easy to draw it out and shape it into a wire.
- High Electrical Conductivity - Due to the electrons moving about, they are great at electrical conductors.
- Lustre - The electrons on the surface reflect light, making them appear shiny.
- High Melting Point - As the metal atoms are closely packed, it takes high temperatures to break them apart.

d. What is an alloy?

An alloy is a mixture of several different elements, with one of the constituents being a metal. What makes an alloy unique is that it takes on the properties of the metal in the mixture but may also take on different properties that none of the constituents initially had. For example, steel is strong and durable like iron but is resistant to oxidation, unlike the metal.