

Metals: Physical Properties and Atomic Structures

Metals are essential materials in our everyday lives, used in everything from buildings to electronics. Their unique physical properties—such as ductility, malleability, conductivity, and luster—make them useful for a wide range of applications. These properties come from how metal atoms are arranged and how they interact with each other. In this worksheet, you'll explore the vocabulary and concepts related to metals, including their atomic structures, types of crystal arrangements, and the ways defects and alloys affect their characteristics.

Fill in the Blank

Fill in the blank with the correct words:

1. The ability of a metal to be drawn into wires is called _____.
2. When a metal is hammered or pressed into a new shape without breaking, this is known as _____.
3. The ability of metals to conduct heat is called _____.
4. Metals are shiny because of their _____, which describes how light interacts with their surface.
5. A mixture of two or more metals that often has improved properties compared to the individual metals is called an _____.

Word bank: alloy luster malleability ductility thermal conductivity

Multiple Choice Questions

Choose the correct answer from the choices for each question:

1. Which property describes a metal's ability to be shaped by hammering without breaking?
 - ☐ A) Ductility
 - ☐ B) Malleability
 - ☐ C) Luster
 - ☐ D) Conductivity
2. Which type of crystal structure is tightly packed, has every atom surrounded by 12 neighbors, and is very ductile?
 - ☐ A) Body-centered cubic (BCC)
 - ☐ B) Face-centered cubic (FCC)
 - ☐ C) Hexagonal close-packed (HCP)
 - ☐ D) Ionic lattice
3. What happens when a metal is forced through a die to make wire?
 - ☐ A) The atoms shatter
 - ☐ B) The cations easily slide past each other
 - ☐ C) The metal loses conductivity
 - ☐ D) The metal becomes brittle
4. What is a point defect in a metal crystal?
 - ☐ A) Atoms are perfectly arranged
 - ☐ B) Atoms are missing or misplaced in the lattice
 - ☐ C) The metal is an alloy
 - ☐ D) The metal is being hammered

5. In steel, what effect do carbon atoms have when they get trapped at dislocation sites?
- A) They make steel softer and more flexible
 - B) They make steel harder than pure iron
 - C) They cause steel to conduct electricity better
 - D) They give steel a shiny luster