

Chemical Bonding in Metals Worksheet

1. Define metallic bonding.

2. What are the properties of a lattice of metallic atoms?

3. Circle the correct option.

Metallic bonds take place due to

- The attraction between metal cations and a cloud of anions
- The attraction between metal anions and a cloud of cations.
- The attraction between metal cations and a cloud of protons.

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Answers

1. Define metallic bonding.

Metallic bonding occurs when a group of metallic cations interacts with the electrons in the outermost shell, i.e., valence electrons, to become stable. As metals generally try to release their electrons to become stable, their electrons move about more freely compared to other atoms. This freedom lets these electrons form a “sea of electrons” that hold together a huge number of metallic atoms.

2. What are the properties of a lattice of metallic atoms?

Most metal lattices display the following properties:

- a) While a metallic lattice appears rigid, it is, in fact, flexible. This is due to the free-flowing nature of the ions in the lattice, whose bonds do not break despite them moving apart. If a metallic lattice is hit, it will likely change shape but rarely shatter.
- b) They are great conductors of electricity thanks to the freely moving ions in the lattice.
- c) Similarly, due to the high ion mobility, metal lattices are great conductors of heat.
- d) These lattices appear shiny or lustrous due to the electrons on the surface of the metal reflecting light at anyone looking at it.
- e) These lattices have high melting and boiling points due to the strong interionic bonds.

3. Circle the correct option.

Metallic bonds take place due to

- a. The attraction between metal cations and a cloud of anions
- b. The attraction between metal anions and a cloud of cations.
- c. The attraction between metal cations and a cloud of protons.