

AP Chemistry

Name: _____ Score: _____

1. A metal transfers electrons to a nonmetal. What bond forms?
☐ metallic
☐ covalent
☐ ionic
2. On a potential-energy versus distance curve, the bond length is at the...
☐ highest point
☐ lowest point of the well
☐ far right where energy is zero
3. An ionic solid conducts electricity...
☐ always, even as a solid
☐ only when molten or dissolved
☐ never, under any condition
4. What carries electric current through a solid metal?
☐ moving positive ions
☐ delocalized electrons
☐ neutrons
5. What is the first step in drawing a Lewis diagram?
☐ count the total valence electrons
☐ add double bonds everywhere
☐ guess the shape
6. An oxygen atom (6 valence) has 4 lone electrons and 4 bonding electrons. Its formal charge?

7. Lone pairs must be counted as electron groups when predicting shape.
☐ True ☐ False
8. A lattice of metal cations in a shared sea of electrons is a _____ bond.

9. A deeper potential-energy well means a weaker bond.

☐ True ☐ False

10. A higher lattice energy generally means a lower melting point.

☐ True ☐ False

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1. **ionic**

Electron transfer between a metal and nonmetal makes an ionic bond.

2. **lowest point of the well**

The minimum is the stable separation – the bond length.

3. **only when molten or dissolved**

Ions must be free to move – that happens when melted or dissolved.

4. **delocalized electrons**

Free (delocalized) electrons move and carry the charge.

5. **count the total valence electrons**

You must know the total electron count before placing anything.

6. **0**

$$FC = 6 - 4 - \frac{1}{2}(4) = 6 - 4 - 2 = 0.$$

7. **True**

Lone pairs occupy space and bend the geometry.

8. **metallic**

This "sea of electrons" model describes a metallic bond.

9. **False**

False. The well depth equals the energy needed to break the bond, so a deeper well means a stronger bond.

10. **False**

False. More lattice energy holds the ions together more strongly, so more heat is needed to break the lattice: a higher melting point.