

AP Chemistry

Name: _____ Score: _____

1. A metal transfers electrons to a nonmetal. What bond forms?
☐ ionic
☐ covalent
☐ metallic
2. On a potential-energy versus distance curve, the bond length is at the...
☐ lowest point of the well
☐ far right where energy is zero
☐ highest point
3. An ionic solid conducts electricity...
☐ only when molten or dissolved
☐ always, even as a solid
☐ never, under any condition
4. What carries electric current through a solid metal?
☐ delocalized electrons
☐ moving positive ions
☐ neutrons
5. What is the first step in drawing a Lewis diagram?
☐ count the total valence electrons
☐ guess the shape
☐ add double bonds everywhere
6. A deeper potential-energy well means a stronger bond.
☐ True ☐ False
7. How many valence electrons does CO_2 have? ($\text{C} = 4$, $\text{O} = 6$ each)

8. An oxygen atom (6 valence) has 4 lone electrons and 4 bonding electrons. Its formal charge?

9. A lattice of metal cations in a shared sea of electrons is a _____ bond.

10. A higher lattice energy generally means a higher 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. **True**

The well depth is the bond energy needed to break the bond.

7. **16**

$4 + 2 \times 6 = 16$ valence electrons.

8. **0**

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

9. **metallic**

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

10. **True**

More energy holds the lattice, so more heat is needed to break it apart.