What Are London Dispersion Forces?

Worksheet

London dispersion forces result from temporary dipoles when electrons briefly accumulate on one side of a molecule. All molecules experience them; they're especially important in noble gases and nonpolar hydrocarbons.

Questions

1. London dispersion forces arise from

A) covalent bonds
B) hydrogen bonding
C) temporary dipoles
D) metallic bonding

2. Which substance experiences ONLY London forces?

A) Water (HO)
B) Hydrogen chloride (HCl)
C) Neon (Ne)
D) Ammonia (NH)

3. More electrons =

A) weaker London forces
B) stronger London forces
C) no London forces
D) same London forces

4. Boiling point trend in the halogen group (F, Cl, Br, I)?

A) decreases
B) stays constant
C) increases
D) random

5. Why do nonpolar molecules like N condense at very low temperatures?

6. Which is stronger: London forces between Cl or Br?

7. Why does hexane (CH) boil at 69 C while methane (CH) boils at 161 C?

8. Define: What causes London dispersion forces?

9. Define: Are London forces present in polar molecules?

10. Define: Why are they called 'dispersion' forces?

Answer Key

1. C) temporary dipoles - Temporary shifts in electron density create momentary charges.

2. C) Neon (Ne) - Neon is a nonpolar noble gas with no other intermolecular forces.

3. B) stronger London forces - More electrons allow larger temporary dipoles.

4. C) increases - Atomic size and electrons increase stronger London forces higher boiling point.

5. N is nonpolar; only London forces hold it. At room temp, kinetic energy > London forces gas. At 196 C, kinetic energy < London forces liquid.

6. Br has more electrons (35 vs 17) larger electron cloud. Larger cloud stronger temporary dipoles. Br experiences stronger London forces.

7. Hexane is longer (24 electrons) larger surface area for forces. Methane is tiny (10 electrons). More electrons = stronger London forces higher boiling point.

8. Temporary shifts in electron distribution creating fleeting dipoles.

9. Yes - they exist in all molecules along with other intermolecular forces.

10. Because the attractive force arises from temporary (dispersed) electron clouds.