

Chemistry 161: Accelerated General Chemistry

Intermolecular forces practice questions

1. Predict which compound in each pair will have the higher melting point.

(a) CS₂ or CCl₄

(b) HI or KI

(c) Cl₂ or F₂

(d) Na₂O or H₂O

(e) SiO₂ or CO₂

(f) CH₄ or NH₃

(g) CHCl₃ or CF₄

(h) CaF₂ or HF

(i) BF₃ or P₄

2. Replace “melting point” in question #1 with: boiling point
vapor pressure

ΔH_{vap}

ΔH_{fus}

Answers:

- (a) CCl₄ (stronger London forces; both are non-polar)
(b) KI (ionic bonds; HI has dipole-dipole interactions)
(c) Cl₂ (stronger London forces; both are non-polar)
(d) Na₂O (ionic bonds; H₂O has hydrogen bonding)
(e) SiO₂ (network covalent, so covalent bonds would be broken; CO₂ has London forces)
(f) NH₃ (hydrogen bonding; CH₄ has only London forces)
(g) CHCl₃ (dipole-dipole interactions; only London forces for CF₄)
(h) CaF₂ (ionic bonds; HF has intermolecular forces only (hydrogen bonding))
(i) P₄ (stronger London forces; both are non-polar)

2. All answers would be the same except for vapor pressure, for which the trends would be reversed.