1. Consider the phase diagram on the right.
   (a) Which point lies at the critical point?
   (b) Which point lies at the triple point?
   (c) Which point corresponds to conditions where the solid and gas phases are in equilibrium?
   (d) What phase transition accompanies moving from point G to point C?
   (e) What phases coexist at point B?
   (f) What phases coexist at point F?

2. A phase diagram of a pure compound has a triple point at 13 °C and 205 mmHg, a normal melting point at 17 °C, and a normal boiling point at 87 °C. Draw a phase diagram for this compound. Which of the following statements regarding this compound are correct?
   (a) The density of the solid is greater than that of the liquid.
   (b) If the pressure is reduced from 835 mmHg to 85 mmHg at a constant temperature of 11 °C, sublimation occurs.
   (c) At a constant pressure of 835 mmHg, evaporation occurs if the temperature is raised from 13 °C to 81 °C.

3. Which intermolecular force or bond is responsible for the density of H₂O(s) being less than that of H₂O(l)?

4. What percentage of the space within the unit cell is occupied by atoms in:
   (a) a face-centred cubic unit cell
   (b) a body-centred cubic unit cell
   (c) a simple cubic unit cell

5. If a metal crystallizes in a face-centred cubic lattice, how many “nearest” neighbours does each metal atom have?

6. In the unit cell to the right, element X is within the cell and element Y is at the corners. What is the formula for this compound?

7. The solubility of CaSO₄ is 2.1 g L⁻¹. What is the $K_{sp}$ of CaSO₄?