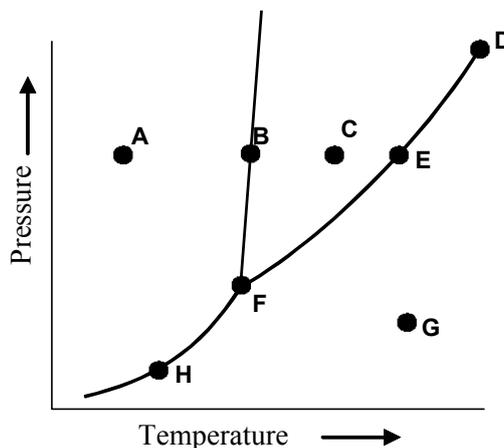


Work through the ChemCAL modules "States of Matter",
and "Solubility Equilibria".

1. Consider the phase diagram on the right.

- Which point lies at the critical point?
- Which point lies at the triple point?
- Which point corresponds to conditions where the solid and gas phases are in equilibrium?
- What phase transition accompanies moving from point G to point C?
- What phases coexist at point B?
- 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?

- The density of the solid is greater than that of the liquid.
- If the pressure is reduced from 835 mmHg to 85 mmHg at a constant temperature of 11 °C, sublimation occurs.
- At a constant pressure of 835 mmHg, evaporation occurs if the temperature is raised from 13 °C to 81 °C.

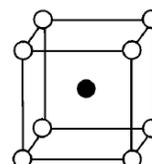
3. Which intermolecular force or bond is responsible for the density of H₂O(s) being less than that of H₂O(l)?

4. What percentage of the space within the unit cell is occupied by atoms in:

- a face-centred cubic unit cell
- a body-centred cubic unit cell
- 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?