1. The melting and boiling points for HCl are -115 °C and -84 °C respectively.

- Draw and label a cooling curve to show the energy changes that occur as hydrogen chloride gas is cooled from -75 °C to -145 °C.
- Show regions of changing kinetic and potential energy on the graph.

2. Chloroethane, C_2H_5Cl, melts at -136.4 °C and boils at 12.3 °C.

- Sketch and label a heating curve for chloroethane being heated from -150 °C to 50 °C.
- Indicate the changes in KE and PE occurring in the different regions of the graph.
- List the forces of attraction overcome as chloroethane evaporates at 12.3 °C.

3. Use the information provided to calculate the total energy change that occurs when 6.75 g of solid lead at -35.0 °C is heated to liquid lead at 500.0 °C. *(634 J)*

c_{solid} = 0.130 J/g.°C

c_{liquid} = 0.138 J/g.°C

melting point = 328.°C

ΔH_{fus} = 4.77 kJ/mol

(Sketching a heating curve may be useful).

4. For each item, sketch a heating or a cooling curve, and calculate the total energy change. Use a 10.0 g sample of each element.

a) Solid aluminum metal at 25 °C is heated to a liquid at 660 °C. *(9.68 kJ)*
c_{solid} = 0.90 J/g.°C ΔH_{fus} = 10.7 kJ/mol ΔH_{vap} = 290.8 kJ/mol mp = 660 °C

b) Krypton gas at 0.0°˚C is cooled and condenses to a liquid at -157 °C. *(-1.47 kJ)*
c = 0.248 J/g.°C bp = -157 °C ΔH_{vap} = 9.029 kJ/mol

c) Titanium metal at 1700°˚C and standard pressure is cooled to 25 °C. *(-12.6 kJ)*
c_{solid} = 0.523 J/g.°C c_{liquid} = 0.439 J/g.°C mp = 1660 °C
ΔH_{fus} = 18.6 kJ/mol ΔH_{vap} = 425.2 kJ/mol