2 A fixed mass of an ideal gas has volume 210 cm^3 at pressure 3.0×10^5 Pa and temperature 270 K.

The volume of the gas is reduced at constant pressure to 140 cm^3, as shown in Fig. 2.1.

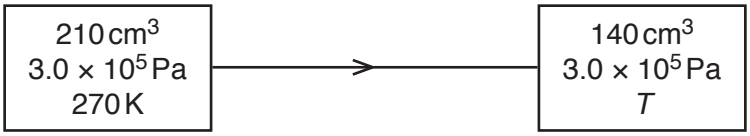

Fig. 2.1

The final temperature of the gas is T.

(a) Determine:

(i) the amount of gas

amount = ... mol [3]

(ii) the final temperature T of the gas

T = ...K [2]

(iii) the external work done on the gas.

work done = ... J [2]

(b) For this change in volume and temperature of the gas, the thermal energy transferred is 53 J.

Determine ΔU, the change in internal energy of the gas.

ΔU = ... J [3]

[Total: 10]