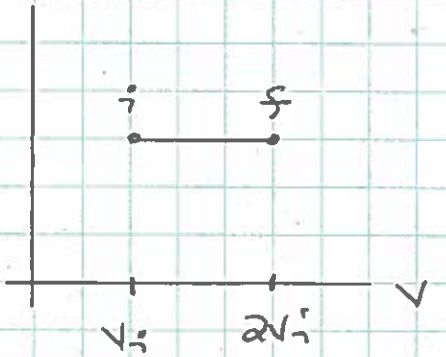
gas 1 monatomic n moles

$C_{V_1} = \frac{3}{2}R$, $C_{P_1} = \frac{5}{2}R$

gas 2 diatomic n moles

$C_{V_2} = \frac{5}{2}R$ $C_{P_2} = \frac{7}{2}R$

Both heated at constant pressure until volume doubles



for both gases

$$Q_1 = nC_{P_1}\Delta T = n\frac{5}{2}R(T_f - T_i)$$

$$= \frac{5}{2}(nRT_f - nRT_i)$$

$$= \frac{5}{2}(PV_f - PV_i)$$

$$= \frac{5}{2}P(2V_i - V_i)$$

$$= \frac{5}{2}PV_i \qquad P = \text{const.}$$

and for gas 2:

$$Q_2 = \frac{7}{2}PV_i$$

$$\therefore \quad \frac{Q_2}{Q_1} = \frac{7/2}{5/2} = \frac{7}{5}$$

So, it takes more heat to raise the temp. of the diatomic gas.