

Example (isothermal)

6.2 mol of an ideal gas is allowed to expand from 2.0 L to 6.3 L under a constant temperature condition of 0°C . Determine the work

$$W_{\text{isothermal}} = nRT \ln\left(\frac{V_2}{V_1}\right)$$

$$n = 6.2 \text{ mol}$$

$$R = 8.31 \frac{\text{J}}{\text{mol K}}$$

$$T = 273 \text{ K}$$

$$V_2 = 6.3 \text{ L}$$

$$V_1 = 2.0 \text{ L}$$

$$W = 6.2 \text{ mol} \left(8.31 \frac{\text{J}}{\text{mol K}} \right) 273 \text{ K} \ln\left(\frac{6.3}{2.0}\right)$$

$$= 1.61 \text{ E}4 \text{ J}$$