Answer on Question #64310 - Chemistry - Physical Chemistry

Question

A sample of an ideal gas is expanded 1m^3 to 3m^3 in a reversible process for which P=KV^2 with K= 6 bar/m^6. Work done by the gas is

Solution:

$$W = \int_{V1}^{V2} PdV = \int_{V1}^{V2} kV^2 dV = k\frac{V^3}{3}|_{V1}^{V2} = k\frac{V_2^3 - V_1^3}{3} = 6\frac{27-1}{3} = 52\ (bar * m^3)$$
$$= 5.2 * 10^6\ (J) = 5.2\ (MJ)$$

Answer: Work done by the gas is **5.2*10^6 J**