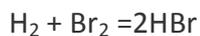


Question #48734, Chemistry, Other

At equilibrium for the reaction $\text{H}_2(\text{g}) + \text{Br}_2(\text{g}) \rightleftharpoons 2\text{HBr}(\text{g})$ in a 10 litre vessel was found to contain 2.5×10^{-2} mole of H_2 , 0.150 mole of HBr and 2.8×10^{-2} mole of Br_2 . What is the value of k at this temperature?

Answer:



$$V=10\text{L}$$

$$n(\text{H}_2)=2.5 \cdot 10^{-2} \text{ mol}$$

$$n(\text{HBr})=0.150 \text{ mol}$$

$$n(\text{Br}_2)=2.8 \cdot 10^{-2} \text{ mol}$$

Because the equilibrium constant is the ratio and the reaction takes place in a constant volume, the concentration can be used instead of the number of particles in order to find the constants:

$$K = \frac{[\text{HBr}]^2}{[\text{H}_2][\text{Br}_2]} = 0.15^2 / (2.5 \cdot 10^{-2} \cdot 2.8 \cdot 10^{-2}) = 32.14$$