Question #48734, Chemistry, Other

At equilibrium for the reaction H2 (g) + Br2 (g) is revesible arrow 2HBr (g) in a 10 litre vessel was found to contain 2.5 X 10 to the power -3 mole of H2 , 0.150 mole of HBr and 2.8 x 10 to the power-3 mole of BR2. What is the value of k at this temperature?

Answer:

$$H_2 + Br_2 = 2HBr$$

V=10L

$n(H_2)$=2.5·10-2 mol

n(HBr)=0.150 mol

$n(Br_2)$=2.8·10-2 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:

$$K=\frac{HBr]^2}{_2][Br_2]}=0.15^2/(2.5\cdot10^{-2}\cdot2.8\cdot10^{-2})=32.14$$