Question #50812, Chemistry, Physical Chemistry

1 g H2 and 46g I2 ARE MIXED IN 450 DEGREE TEMPERATURE TO GET HI.1.9 G I2 IS FOUND AT LAST.WHAT IS THE VALUE OF EQUILIBRIUM CONSTANT? ANS 46.94 HOW?PLEASE SHOW ME THE PROCESS

Answer:

$$H_2 + I_2 => 2HI$$
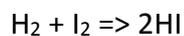
M(I) =127 g/mol

M(H)=1 g/mol

Initially:
1 g H_2 / 2 g/mol = 0.50 mol H2
46 g I_2 / 253.8 g/mol = 0.18 mol I2

At equilibrium:
1.9 g I_2 / 253.8 g/mol = 0.008 mol I2

So, 0.172 mol I2 consumed, which would consume 0.172 mol H_2, leaving 0.328 mol H_2
You would also form 0.344 mol HI.

So,

$$K=\frac{[HI]^2}{[H_2][I_2]} = = (0.344)^2/((0.327)*(0.008)) \approx 46.94$$