EXAMPLE K_c CALCULATIONS - HOMOGENOUS

1. Methanol can be manufactured using the following process.

$$CO_{(g)} + 2H_{2(g)} \quad CH_3OH_{(g)} \quad \Delta H = -94 \text{ kJmol}^{-1}$$

0.242 moles of CO were mixed with 0.360 moles of H_2 in sealed container with a volume of 400cm^3 at a temperature of 550K and left to reach equilibrium.

a) It was found that 0.100 moles of CH_3OH was present at equilibrium.

Calculate K_c, including its units.

Kc = ... Units .....

What would happen to value of K_c, if the temperature was decreased?

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2. A dynamic equilibrium is set up when Nitrogen reacts with Hydrogen to form Ammonia.

$$N_{2(g)} + 3H_{2(g)} \quad 2NH_{3(g)}$$

A 2.0dm^3 vessel was found to contain 0.05 moles of Nitrogen and 0.08 moles of Ammonia once equilibrium was reached at 300K. The value of K_c for this equilibrium at this temperature is 9.6.

a) Calculate the number of moles of Hydrogen present at equilibrium.

b) Deduce the units for K_c for this equilibrium