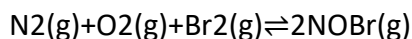
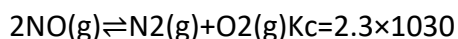
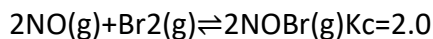


## Answer on the Question #68350, Chemistry / General chemistry

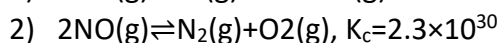
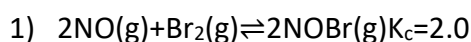
Consider the equilibrium



Calculate the equilibrium constant  $K_p$  for this reaction, given the following information (at 300 K):



### Solution:



If we divide 2 reactions we will get wanted reaction:

$$\frac{[\text{NOBr}]^2}{[\text{NO}]^2 [\text{Br}]} \cdot \frac{[\text{NO}]^2}{[\text{N}_2] [\text{O}_2]} = \frac{[\text{NOBr}]^2}{[\text{N}_2] [\text{O}_2] [\text{Br}]}$$

So if 1) divided by 2) gives you the ratio you want, then  $K_{c1} / K_{c2}$  give us the  $K_c$  for the studied reaction:

$$K_c = \frac{K_{c1}}{K_{c2}} = \frac{2.0}{2.3 \cdot 10^{30}} = 8.7 \cdot 10^{-31}$$

The  $K_c$  can be converted to  $K_p$  by the ratio in which  $RT$  will be in the dominator:

$$K_p = \frac{K_c}{RT} = \frac{8.7 \cdot 10^{-31}}{8.314 \cdot 300} = 3.5 \cdot 10^{-34}$$

Answer provided by AssignmentExpert.com