

LeChatelier and “K” calculations



E 4.0 M 0.50 M 3.0 M 2.0 M

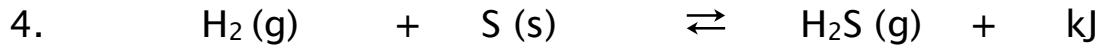
1.5 mol of the $\text{NO}_2(\text{g})$ is added to the 1.00 L equilibrium vessel.
What is the new equilibrium concentration of all species?

Graph both equilibrium concentrations on the same graph.

E₁ 4.0 M 0.50 M 3.0 M 2.0 M

R

E₂



Given: $\frac{0.200\text{mol}}{2.00\text{ L}}$ **X** $\frac{0.200\text{ mol}}{2.00\text{ L}}$

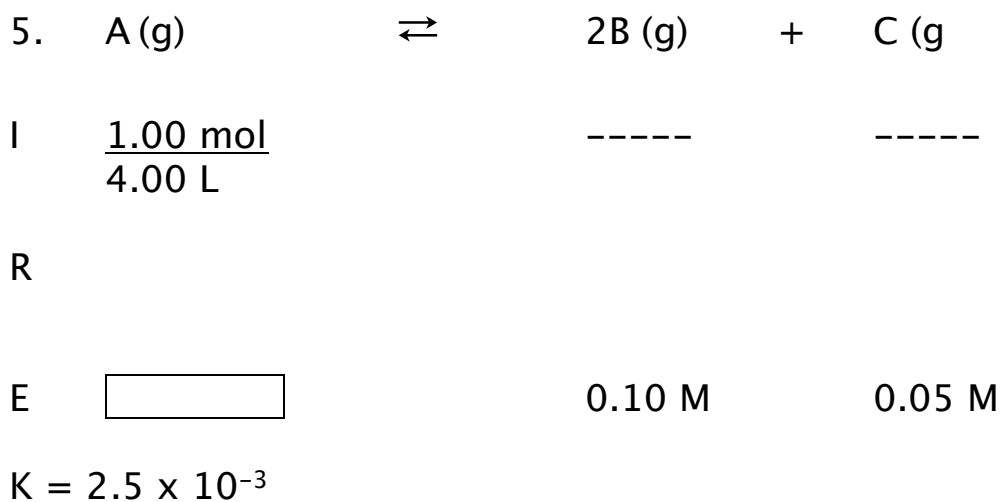
Qn # 1: explain why it doesn't matter that I didn't take into account that sulphur is octatomic when I balanced my equation.



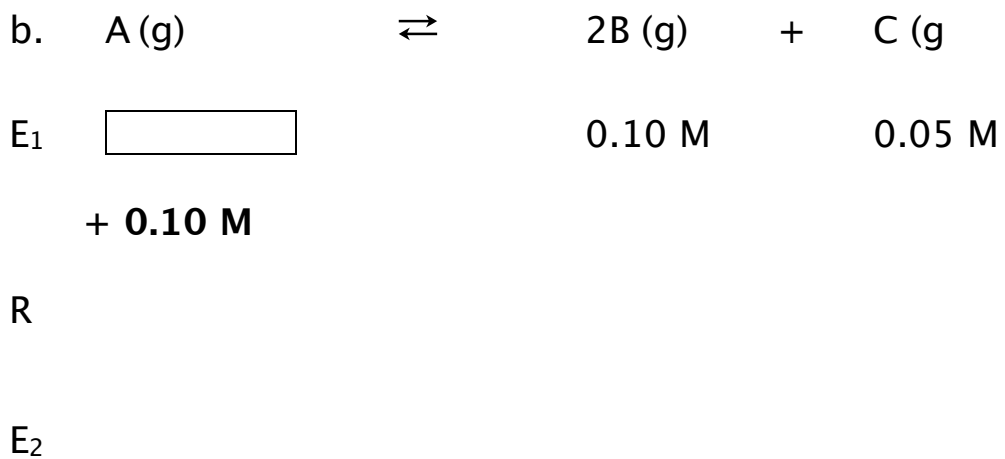
Qn#2: Is the given data at equilibrium?
 (If K at this temperature is given as 14.3).
 If not, what must happen for this system to be at equilibrium?

In your answer, we must start using the following notation:

$$K_{\text{eq}} \quad > / < / = \quad K_{\text{trial}}$$



Calculate $[A]_e$



Calculate the new $[A]_e$ $[B]_e$ $[C]_e$ at the same temperature, under the stress that was imposed as shown in E₁.



I 0.500 M 0.500 M ----- -----
 R
 E

Calculate all four []_e if K = 2.00.

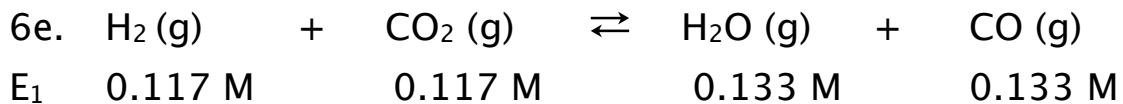
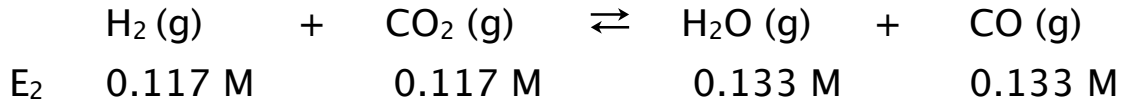
6b. Given new E₂ concentrations, calculate K and describe what stresses could have caused this shift, resulting in these new concentrations:

E₂ 0.105 M 0.105 M 0.145 M 0.145 M

6c. Given new E₂ concentrations, calculate K and describe what stresses could have caused this shift, resulting in these new concentrations:

E₂ 0.240 M 0.240 M 0.133 M 0.133 M

6d. Given new E₂ concentrations, calculate K and describe why we could not explain a stress that would cause the concentrations to change to these numbers (i.e. why these “equilibrium” values would be impossible):



R

E₂ 0.150 M

Calculate how much H₂O (g) was added to the E₁ vessel if K at **this** temperature is equal to 1.29.

6f. On a separate piece of paper (fill the page) graph the equilibrium values, stresses, shifts and new equilibrium values for questions 6b and 6c.