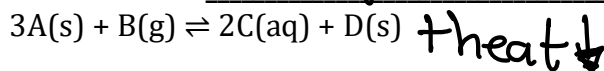


CHE 120 W11 Equilibrium Assessment

Name: Key

1. The exothermic reaction is at equilibrium.



Fill out the table below with how each quantity changes (I = Increases, D = Decreases, or U = Unchanged)

Event	How does K change?	How does moles A present change?	Stress? (not graded)	Response to stress? (Left, Right, None)
The pressure is increased by decreasing the volume	U	D	P↑, so shift to side with fewer moles gas to relieve the stress	Right
1 mol of C(aq) is added.	U	Increase	P↑	Left
The temperature is decreased.	I	D	T decreased - heat ↓	Right
Water is added to the solution.	U	D	V soln increased, shift to side with more moles as -	Right
1 mol of D(s) is added	U	U	no stress	None

b) What is the reaction quotient Q for the reaction above?

$$Q = \frac{[C]^2}{[B]}$$

2. Consider the reaction $N_2(g) + 2O_2(g) \rightleftharpoons 2NO_2(g)$

a) Write the reaction quotient Q for the reaction.

$$Q = \frac{[NO_2]^2}{[N_2][O_2]^2}$$

b) Evaluate Q if 0.20 mol NO_2 , 0.080 mol O_2 , and 0.040 mol N_2 are initially in a 2.0 L container at 500 K.

$$Q = \frac{[0.1]^2}{[0.02][0.04]^2} = 312.5$$

c) At 500 K, the concentration equilibrium constant $K_c = 210$. Which direction (right towards products, left towards reactants, or none-reaction already at equilibrium) does the reaction proceed to reach equilibrium?

