

Name

STURMAN KEY

Period

Date

ANALYZING EQUILIBRIUM GRAPHS

Refer to the graphs below to answer the following questions.

1. At approximately what time is equilibrium reached? ≈ 2.75 min 2 min 45 sec

2. Initially, how do the rates of the forward and reverse reactions compare? Fwd rxn starts out fast then rapidly decreases. Reverse rxn starts out slowly then rapidly increases.

+1 each

3. How do the rates of the forward and reverse reactions compare at equilibrium? They are the same.

4. At equilibrium, how do the concentrations of A and B compare? $[A] > [B]$

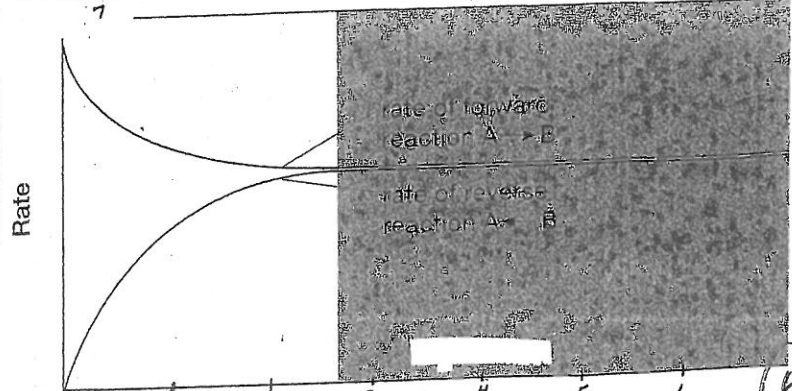
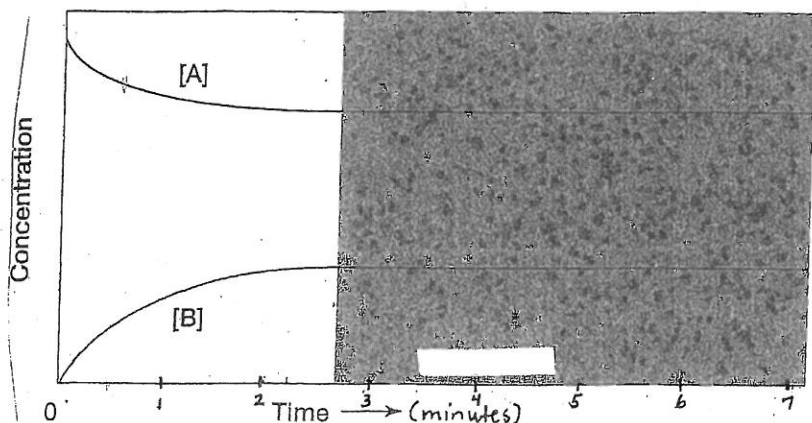
5. What is the balanced equilibrium equation for the reaction graphed below? $A \rightleftharpoons B$

6. Does the equilibrium lie to the left or to the right? Left since more R than P

7. Is K_{eq} less than 1, greater than 1, or equal to 1? $K_{eq} < 1$ since more R than P

8. At 30 seconds how do Q and K_{eq} compare? $Q < K_{eq}$ since at 30 sec more R than at equilibrium

9. If the concentration of B was increased, would the reaction shift left or right? Left.



(b)

Answer the following questions based on the diagram below.

1. What is the equilibrium expression? $\frac{[O_2][H_2]^2}{[H_2O]^2}$
2. Is K_{eq} greater than 1, less than 1, or equal to 1? 8 reactants to 5 products $\therefore K_{eq} < 1$
3. At equilibrium does the reaction lie to the left or right?
Lies left since more reactant
4. Indicate whether the shift is to the left or right for the following stresses added to the system:
- a) add more water right
 - b) add H_2 left
 - c) take out water left
 - d) add heat right
 - e) remove heat left
 - f) increase pressure left
 - g) decrease pressure right
 - h) increase volume which \downarrow pressure \therefore right
 - i) decrease volume which \uparrow pressure \therefore left

Ratio at Equilibrium

