

Chemical Equilibrium Worksheet

- ① b
- ② d
- ③ a
- ④ c
- ⑤ e

$$\textcircled{6} \quad K_{eq} = \frac{[HI]^2}{[H_2][I_2]}$$

$$\textcircled{7} \quad K_{eq} = [NH_3][HCl]$$

$$\textcircled{8} \quad K_{eq} = [As_4][CO]^6$$

$$\textcircled{9} \quad K_{eq} = \frac{[CO_2]^2}{[CO]^2}$$

$$\textcircled{10} \quad K_{eq} = [CO_2]$$

$$\textcircled{11} \quad Q = \frac{[CO_2]}{[CO]^2} = \frac{3.6 \times 10^{-17}}{(0.034)^2}$$

$$Q = 3.11 \times 10^{-14}$$

$Q > K_{eq}$ Reaction will proceed left.

$$\textcircled{12} \quad Q = \frac{[NO_2]^2}{[N_2O_4]} = \frac{(0.2)^2}{2}$$

$$Q = 0.02$$

$Q < K_{eq}$ Reaction will proceed right.

$$(13) \quad Q = \frac{[I_2][Cl_2]}{[ICl]^2} = \frac{(2)(1.2)}{(2.5)^2}$$

$$Q = 0.384$$

$Q > K_{eq}$ Reaction will proceed left.

$$(14) \quad Q = \frac{[H_2O]^3}{[H_2]^3} = \frac{0.37^3}{0.45^3}$$

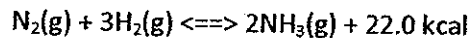
$$Q = 0.56$$

$Q > K_{eq}$ Reaction will proceed left.

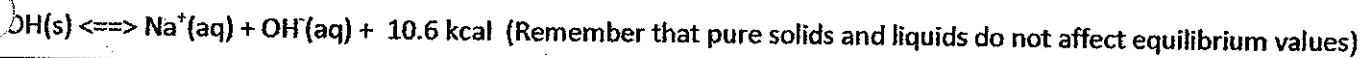
(15)
(16)
(17)

b
c
a

Complete the following charts by writing left, right or none for equilibrium shift, and decreases, increases or remains the same for the concentrations of reactants and products and for the value of K.



Stress	Equilibrium Shift	$[\text{N}_2]$	$[\text{H}_2]$	$[\text{NH}_3]$	K
18. Add N_2	right	-----	decreases	increases	Remains the same
19. Add H_2	right	decreases	-----	increases	same
20. Add NH_3	left	increases	increases	---	same
21. Remove N_2	left	-----	increases	decreases	same
22. Remove H_2	left	increases	---	decreases	same
23. Remove NH_3	right	decreases	decreases	---	same
24. Increase Temperature	left	increases	increases	decreases	decreases
25. Decrease Temperature	right	decreases	decreases	increases	increases
26. Increase Pressure	right	decreases	decreases	increases	same
27. Decrease Pressure	left	increases	increases	decreases	same



Stress	Equilibrium Shift	Amount NaOH(s)	$[\text{Na}^+]$	$[\text{OH}^-]$	K
28. Add NaOH(s)	none	-----	same	same	same
29. Add NaCl (adds Na^+)	left	increases	-----	decreases	same
30. Add KOH (Adds OH^-)	left	increases	decreases	---	same
31. Add H^+ (Removes OH^-)	right	decreases	increases	---	same
32. Increase Temperature	left	increases	decreases	decreases	decreases
33. Decrease Temperature	right	decreases	increases	increases	increases
34. Increase Pressure	none	same	same	same	same
35. Decrease Pressure	none	same	same	same	same