CH 7 Self Assessment pg. 488
Q # 1-8, 15, 20, 21

1. a 2. d 3. c 4. e 5. e 6. e 7. c

8. $CO_2 (g) + H_2 (g) \rightleftharpoons CO (g) + H_2O (g)$

$$K_{eq} = \frac{[CO][H_2O]}{[CO_2][H_2]} \quad \text{but } [CO_2] = [H_2]$$

$$4.9 \times 10^{-3} = \frac{(0.11)^2}{[CO_2]^2}$$

$$\pm\sqrt{4.9 \times 10^{-3}} = \frac{0.11}{[CO_2]} \quad [CO_2] \text{ can't be negative}$$

$$[CO_2] = \frac{0.11}{\sqrt{4.9 \times 10^{-3}}}$$

$$= 1.57 \frac{mol}{L}$$

15. One solution is in a hot water bath, the middle tube is at room temperature and the last tube is in an ice/water bath. As the temperature changes it shifts the rxn to the left or right side.

20. $2NOCl (g) \rightleftharpoons 2NO (g) + Cl_2 (g)$

I	$\frac{1.00}{2.00}$ mol/L	0	0	
C	$-2x$	$+2x$	$+x$	
E	$0.5-2x$	$+2x$	$+x$	

check

$$\frac{0.5}{1.6 \times 10^{-5}} = 31250 > 1000$$

∴ x is small wrt to 0.5

$$K_{eq} = \frac{[NO]^2[Cl_2]}{[NOCl]^2}$$

$$1.6 \times 10^{-5} = \frac{(2x)^2(x)}{(0.5-2x)^2}$$

$$1.6 \times 10^{-5} = \frac{4x^3}{}$$

$x = 0.01$

$[NOCl] = 0.5 - 2x$
$= 0.5 - 2(0.01)$
$= 0.48$ mol/L

$[NO] = 2x$
$= 2(0.01) = 0.020$ mol/L

$[Cl_2] = x$
$= 0.010 \frac{mol}{L}$

21.

$$2N_2O_{(g)} \rightleftharpoons 2N_{2(g)} + O_{2(g)}$$

$$K_{eq} = \frac{[N_2]^2 [O_2]}{[N_2O]^2}$$

$$= \frac{(3.54/3.50)^2 (441/3.50)}{\left(\frac{0.14}{3.50}\right)^2}$$

$$= 806$$

∴ K_{eq} is 806.