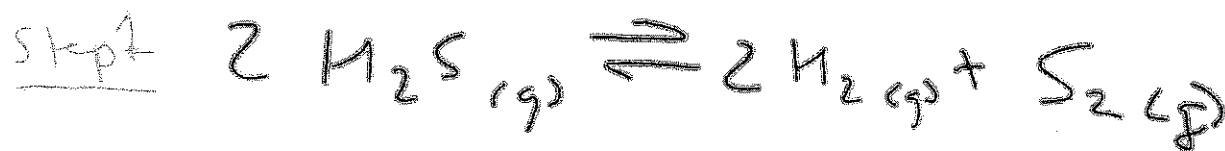


For the reaction,  $2\text{H}_2\text{S}_{(g)} \rightleftharpoons 2\text{H}_{2(g)} + 1\text{S}_{2(g)}$  March 27, 2013

$K_{eq} = 2.34 \times 10^{-4}$ . If the equilibrium concentrations of  $\text{H}_2\text{S}$  and  $\text{H}_2$  are  $0.15\text{M}$  and  $0.010\text{M}$  respectively, what is equilibrium concentration of  $\text{S}_2$ ?



Step 2 
$$K = \frac{[\text{H}_{2(g)}]_E^2 \cdot [\text{S}_{2(g)}]_E}{[\text{H}_2\text{S}_{(g)}]_E^2}$$

If  $1$  or  $2$ ,  $[ ] = 1$   
rewrite without it.

rewrite

Step 3 
$$[\text{S}_{2(g)}]_E = \frac{K \cdot [\text{H}_2\text{S}_{(g)}]_E^2}{[\text{H}_{2(g)}]_E^2}$$

Define variables

$$K = 2.3 \times 10^{-4} \text{ M}$$

$$K = \frac{\text{M}^2 \cdot \text{M}^1}{\text{M}^2} = \text{M}$$

$$[\text{S}_2]_E = \frac{(2.3 \times 10^{-4} \text{ M})(0.15\text{M})^2}{(0.01\text{M})^2}$$

$$[\text{H}_2\text{S}]_E = 0.15\text{M}$$

$$[\text{H}_2]_E = 0.01\text{M}$$

$$[\text{S}_2]_E = ?$$

$$= 0.05175\text{M}$$
  
$$[\text{S}_2]_E = 0.0518\text{M}$$