

#Jenny



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Cool! I'am really happy

#Markus Jensen



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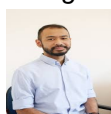
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My friends are so mad that they do not know how I have all the high quality ebook which they do not!

#Diego Butler



so many fake sites. this is the first one which worked! Many thanks

Chemistry 12 Unit 3 - Solubility of Ionic Substances

**KEY**

32. The solubility of  $\text{CoCO}_3$  in water is  $1.189 \times 10^{-3}$  grams per liter. Calculate the  $K_{sp}$  for  $\text{CoCO}_3$ .

$$\text{CoCO}_3(s) \rightleftharpoons \text{Co}^{2+} + \text{CO}_3^{2-}$$

$\begin{matrix} \text{CoCO}_3(s) & \rightleftharpoons & \text{Co}^{2+} & + & \text{CO}_3^{2-} \\ \uparrow & & \uparrow & & \uparrow \\ -1.000 \times 10^{-3} \text{ M} & & +1.000 \times 10^{-3} \text{ M} & & +1.000 \times 10^{-3} \text{ M} \end{matrix}$

$\begin{matrix} \text{sol} = 1.189 \times 10^{-3} \text{ g} \times \frac{1 \text{ mol}}{118.9 \text{ g}} \\ = 1.000 \times 10^{-5} \text{ M} \end{matrix}$

$$K_{sp} = [\text{Co}^{2+}][\text{CO}_3^{2-}] = (1.000 \times 10^{-3})^2 = 1.000 \times 10^{-6}$$

Answer:  $K_{sp} = 1.000 \times 10^{-6}$

33. Will a precipitate form if 100 mL of  $1.0 \times 10^{-3}$  M  $\text{Pb(NO}_3)_2$  solution is added to 100.0 mL of  $2.0 \times 10^{-3}$  M  $\text{MgSO}_4$  solution? Show all calculations and include the Trial  $K_{sp}$ .

possible ppt is:  $\text{PbSO}_4(s) \rightleftharpoons \text{Pb}^{2+} + \text{SO}_4^{2-}$

$$[\text{Pb}^{2+}] = 1.0 \times 10^{-3} \text{ M} \times \frac{100 \text{ mL}}{200 \text{ mL}} = 5 \times 10^{-4} \text{ M}$$

$$[\text{SO}_4^{2-}] = 2.0 \times 10^{-3} \text{ M} \times \frac{100.0 \text{ mL}}{200 \text{ mL}} = 1 \times 10^{-3} \text{ M}$$

$$\text{Trial } K_{sp} = [\text{Pb}^{2+}][\text{SO}_4^{2-}] = (5 \times 10^{-4})(1 \times 10^{-3})$$

Answer: Yes. A ppt will form.

34. Will a precipitate form if 2.50 grams of  $\text{Na}_2\text{SO}_4$  is added to 60.0 mL of a  $2.0 \times 10^{-4}$  M solution of  $\text{BaCl}_2$ ? Show all calculations and include the Trial  $K_{sp}$ .

$$2.50 \text{ g Na}_2\text{SO}_4 \times \frac{1 \text{ mol}}{142.1 \text{ g}} = 1.759 \times 10^{-2} \text{ mol}$$

$$[\text{SO}_4^{2-}] = \frac{1.759 \times 10^{-2} \text{ mol}}{0.0600 \text{ L}} = 2.932 \times 10^{-1} \text{ M}$$

$$[\text{Ba}^{2+}] = 2.0 \times 10^{-4} \text{ M}$$

Answer: Yes. A ppt will form.

$$\text{BaSO}_4(s) \rightleftharpoons \text{Ba}^{2+} + \text{SO}_4^{2-}$$

$$\text{Trial } K_{sp} = [\text{Ba}^{2+}][\text{SO}_4^{2-}]$$

$$\text{Trial } K_{sp} = (2.0 \times 10^{-4})(2.932 \times 10^{-1})$$

$$\text{Trial } K_{sp} = 5.9 \times 10^{-5} > 1.1 \times 10^{-10} \text{ so ppt will form}$$

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