

Ksp--Precipitation

Problem

1. (brady770) A student wishes to prepare a 1.0L solution containing 0.015 mol of NaCl and 0.15mol of $Pb(NO_3)_2$. Using a reaction Quotient will a precipitation occur. K_{sp} of $PbCl_2 = 3.4E-5$ (Last modified 05-14-05)

$$K = [Pb^{2+}][Cl^-]^2 \quad Q < K$$

$$(0.15)(0.015)^2 = 3.37E-5$$

No precipitation

2. (brady771) What possible precipitate might form by mixing 50.0mL of $1.0E-4$ NaCl with 50.0mL of $1.0E-6$ M $AgNO_3$? Will it form? (Last modified 05-14-05) ($K_{sp} AgCl = 1.6E-10$)

double volume

$AgCl$
 $\swarrow \quad \searrow$
 $.5E-6 \quad 0.5E-4$

$$K_{sp} = [Ag^+][Cl^-]$$

$$= (.5E-6)(0.5E-4)$$

$$Q = 2.5E-11$$

$Q < K$ No precipitation

3. (brown670) Will a precipitate form when 0.10L of $8.0E-3$ M $Pb(NO_3)_2$ is added to 0.40L of $5.0E-3$ M Na_2SO_4 ? (Last modified 12-4-2014)

$$M_1 V_1 = M_2 V_2$$

$$0.1 \cdot 8E-3 = M_2 \cdot 0.5$$

$$M_2 = 0.0016$$

$$[Pb^{2+}][SO_4^{2-}] = 6.3E-7 \quad K_{sp}$$

$$(0.4)(5E-3) = (0.5)(x)$$

$$M_2 = 0.004$$

$$.004 \cdot .0016 = 6.4E-6$$

$Q < K$ No Prec.

4. (brown671) $1.0E-2$ M Ag^+ and $2.0E-2$ M Pb^{2+} . When Cl^- is added to the solution, both $AgCl$ ($K_{sp} = 1.8E-10$) and $PbCl_2$ ($K_{sp} = 1.7E-8$) precipitate from the salt solution. What concentration of Cl^- is necessary to begin the precipitation of each salt and since these are in the same jar which will precipitate first? (good Question ☺) (Last modified 05-14-05)

SKIP