## Answer on the question #62836, Chemistry / General Chemistry

**Question:**

what precipitate forms when aqueous solutions of calcium bromide and potassium phosphate are mixed? What is the work shown to figure this out?

**Answer:**

According to the solubility table, calcium phosphate $Ca_3(PO_4)_2$ is insoluble.

**Solubility Table**
**Common Ionic Compounds**

| | Group 1 | | | | Group 2 | | | | Transition Metals | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $NH_4^+$ | $Li^+$ | $Na^+$ | $K^+$ | $Mg^{2+}$ | $Ca^{2+}$ | $Ba^{2+}$ | $Al^{3+}$ | $Fe^{3+}$ | $Cu^{2+}$ | $Ag^+$ | $Zn^{2+}$ | $Pb^{2+}$ |
| $F^-$ | sol | sol | sol | sol | insol | insol | sl sol | sol | sl sol | sol | sol | sol | insol |
| $Cl^-$ | sol | sol | sol | sol | sol | sol | sol | sol | sol | sol | insol | sol | sol |
| $Br^-$ | sol | sol | sol | sol | sol | sol | sol | sol | sol | sol | insol | sol | sl sol |
| $I^-$ | sol | sol | sol | sol | sol | sol | sol | sol | | | insol | sol | insol |
| $OH^-$ | sol | sol | sol | sol | insol | sl sol | sol | insol | insol | insol | | insol | insol |
| $S^{2-}$ | sol | sol | sol | sol | | | | | insol | insol | insol | insol | insol |
| $SO_4^{2-}$ | sol | sol | sol | sol | sol | sl sol | insol | sol | sol | sol | sl sol | sol | insol |
| $CO_3^{2-}$ | sol | sol | sol | sol | insol | insol | insol | | | | insol | insol | insol |
| $NO_3^-$ | sol | sol | sol | sol | sol | sol | sol | sol | sol | sol | sol | sol | sol |
| $PO_4^{3-}$ | sol | insol | sol | sol | insol | insol | insol | insol | insol | insol | insol | insol | insol |
| $CrO_4^{2-}$ | sol | sol | sol | sol | sol | sol | insol | | insol | insol | insol | insol | insol |
| $CH_3CO_2^-$ | sol | sol | sol | sol | sol | sol | sol | sl sol | sol | sol | sol | sol | sol |

sol — soluble
sl sol — slightly soluble
insol — insoluble
(blank) — compound does not exist



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Thus, the precipitate formed when two solutions are mixed is calcium phosphate $Ca_3(PO_4)_2$.

The equation of chemical reaction between calcium bromide and potassium phosphate is needed to figure this out:

$$3CaBr_2 + 2K_3PO_4 \rightarrow 2Ca_3(PO_4)_2 \downarrow + 6KBr$$

In its turn, potassium bromide is soluble.