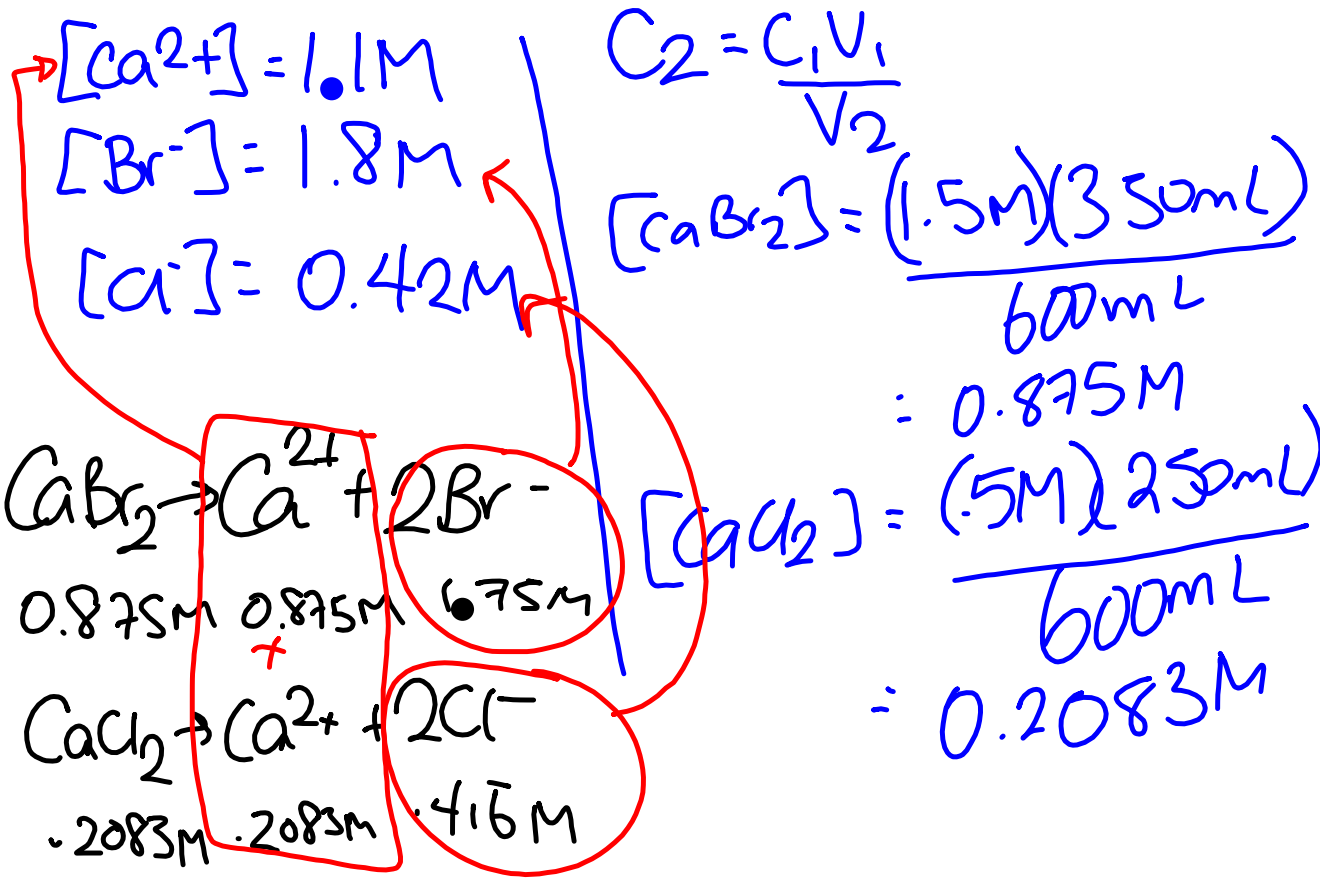
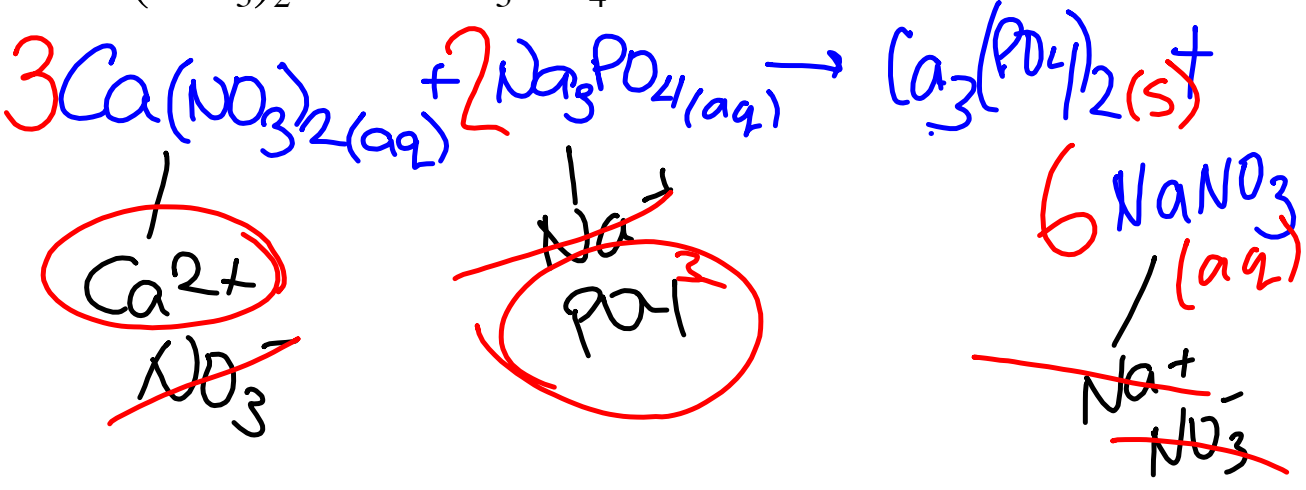
Calculate the concentration of each ion present when 350.0 mL of 1.5 M $CaBr_2$ is mixed with 250.0 mL of 0.50 M $CaCl_2$.



Writing Formula, Complete & Net Ionic Equations

- in Chem12, all reactions that produce precipitates (ppts) are DOUBLE REPLACEMENT reactions
  - > positive ion in each compound exchanges

ex. Write balanced equation for reaction of $Ca(NO_3)_2$ with Na_3PO_4.



- once the precipitate is determined, you must be able to write the equation in three different ways

1. **Formula Equation** = balanced equation in which all reactants and products given by chemical formula

$$3Ca(NO_3)_2(aq) + 2Na_3PO_4(aq) \rightarrow 6NaNO_3(aq) + Ca_3(PO_4)_2(s)$$

2. **Complete Ionic Equation** = shows all soluble compounds as ions

$$3Ca^{2+} + 6NO_3^- + 6Na^+ + 2PO_4^{3-} \rightarrow 6Na^+ + 6NO_3^- + \mathbf{Ca_3(PO_4)_2(s)}$$

3. **Net Ionic Equation** = all **spectator ions** are removed; spectator ions do not take part in the reaction and appear on both sides of the equation unchanged

$$3Ca^{2+} + \mathbf{6NO_3^-} + \mathbf{6Na^+} + 2PO_4^{3-} \rightarrow \mathbf{6Na^+} + \mathbf{6NO_3^-} + Ca_3(PO_4)_2(s)$$

$$3Ca^{2+} + 2PO_4^{3-} \rightarrow Ca_3(PO_4)_2(s)$$

*Note - if only net ionic is needed, simply determine the precipitate and write the balanced set of ions to complete the reaction

Q. Write the formula equation, complete ionic equation and net ionic equation for the reaction of equal volumes of 0.2 M solutions of $Pb(NO_3)_2$ and KI.

① formula eq. — 1- predict products; 2- balanced; 3- determine solubilities (ppt)?

$$2KI_{(aq)} + Pb(NO_3)_{2(aq)} \rightarrow 2KNO_{3(aq)} + PbI_{2(s)}$$

② Complete Ionic Eq → break (aq) into ions

$$2K^+_{(aq)} + 2I^-_{(aq)} + Pb^{2+}_{(aq)} + 2NO_3^-{}_{(aq)} \rightarrow 2K^+_{(aq)} + 2NO_3^-{}_{(aq)} + PbI_{2(s)}$$

③ Net Ionic Eq - remove spectators.

$$Pb^{2+}_{(aq)} + 2I^-_{(aq)} \rightarrow PbI_{2(s)}$$