

Pre-lab paper

[Science](#), [Chemistry](#)

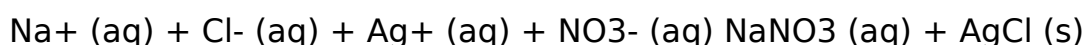
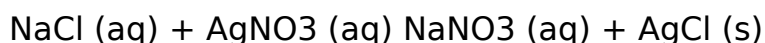


Pre-Lab Paper Objectives i. To determine the amount of precipitate yielded in the reaction and ii. To determine the methods of increasing the yield

Before coming to lab

a) Na_2SO_4 is soluble in water

b) CaCO_3 is insoluble in water



Procedure

Two beakers labeled CuSO_4 (aq) and $\text{Ca}(\text{NO}_3)_2$ (aq), and six test-tubes labeled A, A1, A2 & B, B1, B2 using stickers were used. Weights of A & B recorded.

Part I: CuSO_4 and $\text{Ca}(\text{NO}_3)_2$ reacted.

Accurately 50 ml of aqueous solution of 0.5M of CuSO_4 in one beaker and 50ml of aqueous solution of 0.3M of $\text{Ca}(\text{NO}_3)_2$ in another beaker was prepared. In test-tube A, put 2ml of CuSO_4 & 4ml of $\text{Ca}(\text{NO}_3)_2$. In test-tube B, put 4ml of CuSO_4 & 2ml of $\text{Ca}(\text{NO}_3)_2$. Shake the test-tubes gently. Allow about 5 minutes of reaction. Record your observations.

Part II: Solids separated.

The contents of test-tubes A & B were centrifuged to obtain the solids. Half of the supernatants from A & B were transferred to A1, A2 and B1, B2 respectively. The precipitates in A & B were washed using 4ml of ethanol, centrifuged for 5 minutes; the supernatant removed carefully using a pipette, discarded and the precipitates left to dry.

Part III: Supernatants in A2, A2, B1, B2 tested.

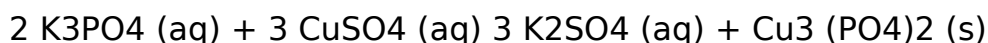
2ml of CuSO_4 were added in A1 & B1 and 2ml of $\text{Ca}(\text{NO}_3)_2$ added in A2 & B2. The observations were recorded in each case and the contents of A1, A2, B1, B2 discarded.

Part IV: Precipitates weighed.

The precipitates in A & B weighed and their masses recorded. The contents of A & B were then discarded.

Discussion

The blue color of copper (ii) ions disappears. A colorless solution is formed. The formation of the colorless solution was due to the reduction of copper (ii) ions (Cu^{2+}) to copper metal. The results may not be accurate due to partial dissolution and spills of the solution during the experiment. The white precipitate was formed due to formation of the insoluble calcium sulphate.



The yield can be optimized by;

- (i) Adding more copper (ii) sulphate solution
- (ii) Reducing the amount of calcium nitrate solution used.

Work Cited

Masterton , L., W. Chemistry: Principles and Reactions. (7th Edition). West Port: Cengage Learning, 2011