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EXPERIMENT NO. - 6

NAME OF EXPERIMENT: TO OBTAIN BLACK OXIDE OF COPPER AND STUDY IT'S PROPERTIES

APPARATUS REQUIRED

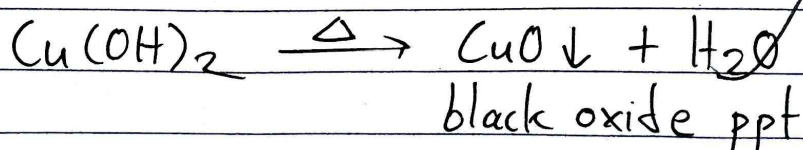
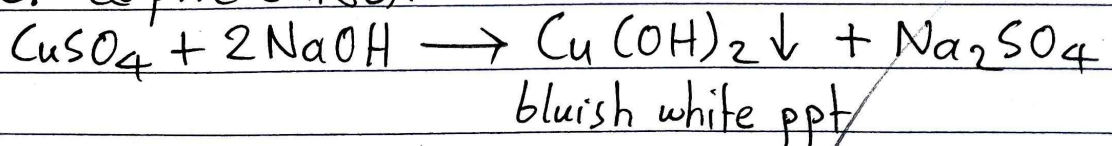
- | | | |
|---------------------|-------------------|--------------|
| 1. Beaker | 2. Glass rod | 3. Burner |
| 4. Tripod stand | 5. Wire gauze | 6. Test tube |
| 7. Test tube holder | 8. Test tube rack | 9. Funnel |
| 10. Filter paper | | |

CHEMICALS REQUIRED

- | | |
|--------------------|-----------------------------|
| 1. Copper sulphate | 2. Dilute sodium hydroxide |
| 3. Glucose | 4. Barium chloride solution |
| 5. Sulphuric acid | 6. Conc. hydrochloric acid |

THEORY

When copper sulphate solution is treated with bench sodium hydroxide then a bluish white precipitate of cupric hydroxide is obtained. The precipitate on heating strongly decomposes to give black oxide of copper (cupric oxide).



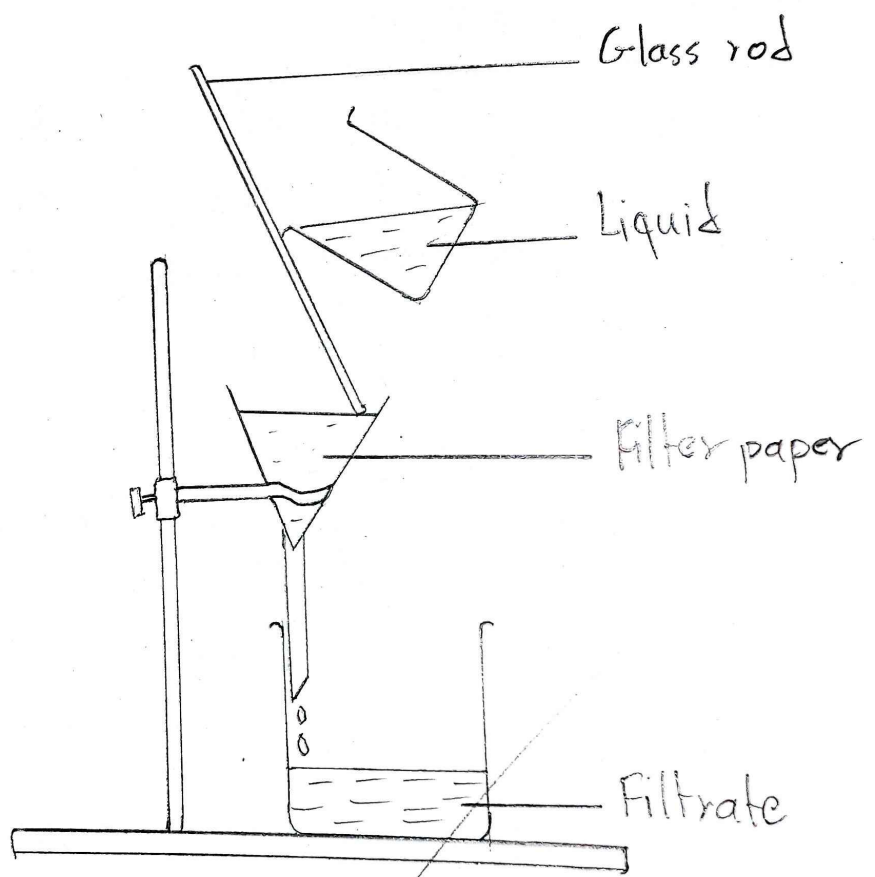
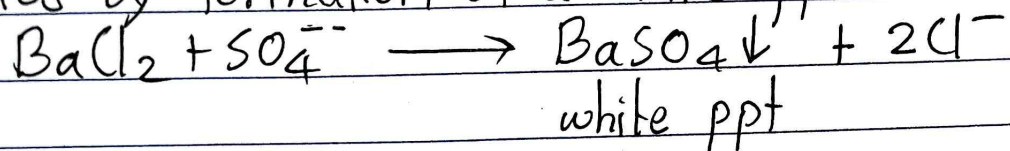


fig. Filtration

The purity of black oxide can be checked by treating the residue washed water with few drops of BaCl_2 solution. Presence of sulphate ion in the residue is indicated by formation of a white ppt.



PROCESS

1. A test tubeful of strong solution of copper sulphate was taken in a beaker.
2. Bench sodium hydroxide was added to obtain a bluish white precipitate.
3. The solution was allowed to stand for some time in order to settle down the precipitate. To the supernatant liquid, a drop of bench NaOH was added.
4. A fresh ppt was appeared. So, few more drops of bench NaOH was added. Again, the completeness of precipitation was checked as in No. (3).
5. No fresh ppt was appeared so the solution was strongly heated.
6. Black residue was formed. When no more black residue was formed, the solution was filtered.
7. The residue was washed 2-3 times with distilled water.
8. Few drops of residue-washed water coming out from the stem of the funnel was taken in a test tube. To this, few drops of barium chloride solution was added.
9. A white precipitate was appeared which mean the

black oxide was contaminated with SO_4^{--} ions (Na_2SO_4 solution). The ppt was washed again.

10. When no more ppt was produced by the residue-washed water with $BaCl_2$ solution, then the black residue was left to dry in air.

STUDY OF ITS PROPERTIES

1. Concentrated sulphuric acid was added to a pinch of the black oxide in a test tube. A blue colouration was seen.

OBSERVATIONS

Experiment	Observation	Inference
1. The black residue-washed water was treated with few drops of $BaCl_2$ solution.	1. White ppt	1. Presence of SO_4^{--} ion in the black oxide.
2. After washing, the black residue-washed water was treated with few drops of $BaCl_2$ solution.	2. No any ppt	2. Absence of SO_4^{--} ion in the black oxide.
3. A pinch of the black oxide was treated with H_2SO_4 .	3. Blue colouration was seen.	3. Formation of $CuSO_4$ solution (black oxide is a basic oxide).

