

Green and Blue Copper Complexes

Purpose

To demonstrate that different ligands exhibit different colors in a coordination complex.

Materials

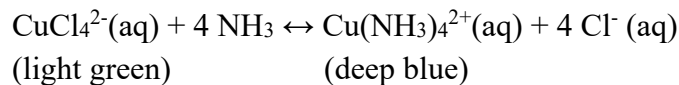
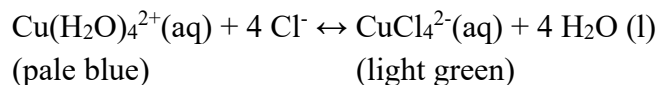
0.2M CuSO ₄ • 5 H ₂ O solution (50g/L)	Large graduated cylinder
Concentrated HCl	Pipet
Concentrated ammonia	

Procedure

1. Fill the graduated cylinder about one-fourth with the copper sulfate solution.
2. Add the HCl until a pale green solution is formed.
3. Use the pipet to add the ammonia until a deep blue color forms. The deep blue solution should sit above the green solution.

Additional Information

1. The reactions are:



2. The tetraaquacopper (II) and tetraaminecopper (II) complexes have a square planar structure. The tetrachlorocopper (II) complex has a tetrahedron structure.

Disposal

Solutions should be placed in properly labeled waste containers with UI# 100947.

Reference

Summerlin, L., Borgford, C., & Ealy j. Chemical Demonstrations: A Sourcebook for Teachers, Volume 2, Second Edition, 1988.