

Student's Card 4 Renewable Keratin wastes for use in metal mining

Module 4



Objective: WOOL ABSORPTION OF HEAVY METALS

Introduction

In recent years various applications of wool have been studied; in particular it has been discovered that wool could be used to clean up soils contaminated of heavy metals. In this respect its use would have a dual purpose: to help with the disposal of extra and waste wool and to use a completely natural material.

Necessities



Reagents	Formula		Quantity (g) or Concentration (M)
Copper (II) sulphate	CuSO_4		$\text{CuSO}_{4(aq)}$ 200mg/l

List of materials/tools

- Wool flock
- 2 Test strips for dosing copper
- Beaker
- Glass rod
- 2 Beakers
- Pliers
- Gloves
- Safety Glasses

Lab Procedure

Pour a few ml of the solution of copper (II) sulphate into a beaker, then add a piece of wool flock and blend the compound until it is completely soaked in the solution. Wait a few hours.

Pour some solution of copper (II) sulphate in the other beaker and immerse briefly a strip in both beakers, wait 20 seconds and watch the colouring. Thanks to their change in colour, it is possible to determine the variation of concentration of copper in wool.

Additional Safety Notes



Wear gloves and safety glasses

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Results:

Strip colour DEEP PURPLE → HIGH concentration of COPPER

Strip colour PINK → LOW concentration of COPPER

Solutions	Strip Colour	Solution concentration
Copper (II) sulphate solution		
Copper (II) sulphate solution and wool		



Questions/Quiz

1. Which colouring has the wool taken after being soaked in copper sulphate? Why?
2. Work out the quantity of copper absorbed by the wool during the time of incubation.
3. Do you think that time should be considered a variable to evaluate wool's ability of absorption?
How could you verify this?
4. Think of an experiment to measure the quantity of wool needed to absorb a fixed quantity of copper.