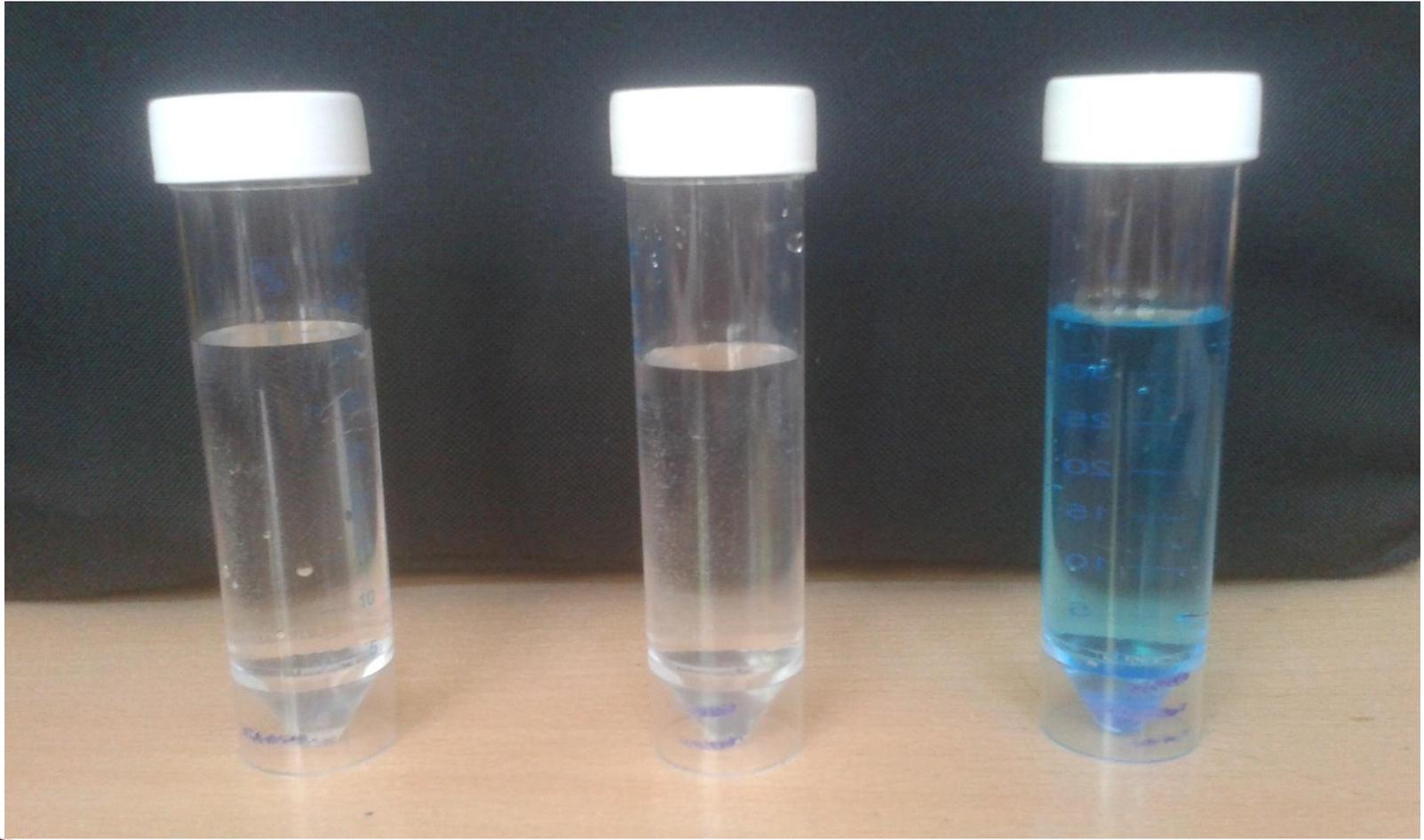


# 24. Chemistry

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# Problem

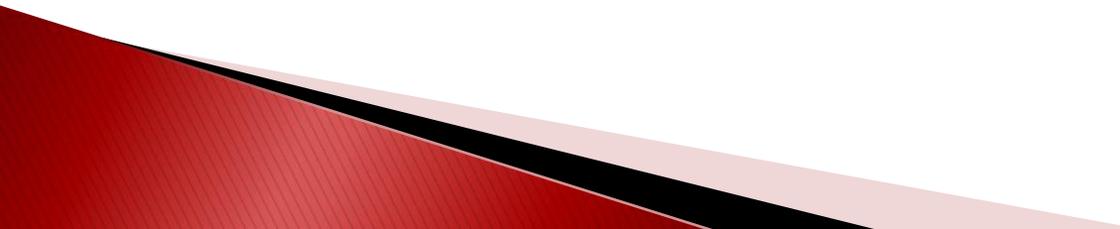
- ▶ A list of compounds includes  $\text{CuSO}_4$ ,  $\text{K}_2\text{Cr}_2\text{O}_7$ ,  $\text{MgCl}_2$ ,  $\text{NaCl}$ . Three of those are in three marked test tubes. Determine the contents of each test tube.



# Plan for solving the problem

- ▶ 1. test blue solution by: vapourising water to get blue sediment, heating up sediment to get white sediment, add water
- ▶ 2. Testing first two solutions with flame

# Materials

- ▶ Vials 1, 2 and 3, with solutions
  - ▶ Botle with water
  - ▶ Alcohol lamp
  - ▶ Test tubes
  - ▶ Alcohol
  - ▶ Carbon stick (for pencils)
- 

# Vials

- ▶ Vial number 1 and 2 are colorless solutions, so we first need to examine them with the experiments
- ▶ Vial number 3 had blue solution and blue sediment at the bottom which we can assume is  $\text{CuSO}_4 \cdot 5 \text{H}_2\text{O}$
- ▶ There is no orange colored vial, which we assume there is no  $\text{K}_2\text{Cr}_2\text{O}_7$

# Hypothesis

- ▶ Of all four chemicals, we consider that  $\text{K}_2\text{Cr}_2\text{O}_7$  isn't in the vial since it has characteristic orange color
- ▶  $\text{CuSO}_4$  is usually blue when combined with water and under influence of fire it will change color to white when the water evaporates
- ▶ Solution of  $\text{NaCl}$  in fire will color flame in orange

# CuSO<sub>4</sub>

- ▶ The experiment was done as expected, and all the water evaporated from the sediment taken from the bottom of the vial, leaving white sediment proving it is CuSO<sub>4</sub>
- ▶ For now our results are that the vial number 3 contains CuSO<sub>4</sub>





# NaCl

- ▶ The experiment done with the NaCl is proving that by adding a small amount to the fire, we get an orange flame
- ▶ We have done the experiment and the results were successful, so we can say that the vial 1 contains NaCl solution

# Conclusions

- ▶ 1. vial – NaCl
  - ▶ 2. Vial – MgCl<sub>2</sub>
  - ▶ 3. Vial – CuSO<sub>4</sub>
  - ▶ No K<sub>2</sub>Cr<sub>2</sub>O<sub>7</sub> in vials
- 
- ▶ Literature: Slikovni rječnik kemije (Illustrated chemistry glossary)

**Thank You for attention!**

