

The scenario

Subject	Trommer's test
Length	3,54 min.
Main objectives	Understanding the reducing properties of simple sugars.
Detailed objectives	Observation of changes taking place during the Trommer's reaction Learning to write reactions notation in ionic form
Structure and description of experiments:	
Introduction	Description: Simple sugars containing an aldehyde group have reducing properties. This is used to detect them in the presence of copper (II) hydroxide. The aldehyde group is oxidized to the carboxylic acid, while copper in the second oxidation state is reduced to copper (I) oxide. As a result of this reaction, a characteristic brick-red Cu ₂ O precipitate appears. Simple sugars containing an aldehyde group and other aldehydes undergo this reaction. Ketones in the Trommer's reaction give a negative result.
Main subject	Description: Understanding the reaction of detecting simple sugars.
Experiment	<p>Equipment: a test tube, a beaker with hot water, Pasteur pipettes</p> <p>Reagents: copper(II) sulphate (VI) solution, NaOH solution, saturated glucose solution.</p> <p>Description: Put 2 ml of copper (II) sulphate (VI) solution in a clean test tube, then add a few drops of NaOH solution to the same test tube. Observe the changes in the contents of the tube at this stage. Add a few drops of aqueous glucose solution to the suspension thus obtained and mix the contents of the tube. Place the test tube with the mixture in a beaker with hot water for a few minutes.</p> <p>Questions:</p> <ol style="list-style-type: none"> Write down the equations of reactions taking place in the test tube, after adding NaOH and after adding glucose. Which of the following substances will give a positive effect on the Trommer test: formaldehyde, acetone, saccharose, or fructose? <p>Conclusions: During the reaction, copper(II) hydroxide is formed, visible as a blue colloidal precipitate. On heating with glucose, this precipitate transforms into an orange and brick-red precipitate of copper(I) oxide. Glucose and other simple sugars contain an aldehyde group and therefore have reducing properties.</p> <p>$\text{CuSO}_4 + \text{NaOH} \rightarrow \text{Cu(OH)}_2$</p> <p>$\text{C}_6\text{H}_{12}\text{O}_6 + \text{Cu(OH)}_2 \rightarrow \text{C}_6\text{H}_{12}\text{O}_7 + \text{Cu}_2\text{O} \downarrow$</p> <p>Level: Secondary School</p>

