

The scenario

Subject	Properties of selected organic compounds: alcohols, unsaturated compounds
Length	5,06 min.
Main objectives	Learning about some properties of organic compounds
Detailed objectives	Observation of changes occurring during the reaction Learning the properties of organic compounds Learning the properties of salts of weak acids and strong bases
Structure and description of experiments:	
Introduction	Description: Ethyl alcohol, phenol and sodium hydroxide contain a hydroxyl group in their structure. However, only the last compound produces the characteristic dark red color with phenolphthalein. Sodium oleate, although it does not have a hydroxyl group, also gives a positive result in this reaction. Alcohols and phenols do not dissociate in the same way in water as inorganic hydroxides, so they are not alkaline. Sodium oleate as a salt of a weak acid and a strong hydroxide undergoes hydrolysis with the release of oleic acid and ionized sodium hydroxide. Therefore, the last test tube also gives a positive reaction to phenolphthalein.
Main subject	Description: Learning about the properties of alcohols and phenols. Learning about the properties of salts formed from weak acids and strong hydroxides.
Experiment	<p>Equipment: test tubes, Pasteur pipettes, spatula, water wash bottle.</p> <p>Reagents: ethyl alcohol, sodium hydroxide solution, sodium oleate, phenol solution, phenolphthalein solution.</p> <p>Precautions: work with gloves and protective glasses!</p> <p>Description: Using a Pasteur pipette add successively, approximately 1 ml of ethyl alcohol, phenol solution, and sodium hydroxide to three test tubes placed in a stand. To the fourth test tube, add a pinch of solid sodium oleate and add a few ml of water from the wash bottle. Then add a few drops of the phenolphthalein solution to each test tube.</p> <p>After completing the exercise, pour the solutions into the containers indicated by the teacher.</p> <p>Questions:</p> <ol style="list-style-type: none"> Note down the changes taking place in each test tube Why did some test tubes fail to react? Explain why the reaction in the test tube with sodium oleate is so different? <p>Conclusions: Phenolphthalein in an alkaline environment gives a characteristic dark red color. This reaction takes place in a test tube containing sodium hydroxide. In test tubes with alcohol and phenol, the reaction does not occur even though these compounds also have OH (hydroxyl) groups. The sodium oleate tube also shows a dark red color even</p>

though it does not contain hydroxyl groups. The formation of an alkaline reaction requires the hydrolysis of sodium hydroxide to form the hydroxide ion OH^- . Alcohols and phenols do not form such ions in aqueous solutions. A solution of sodium oleate as a salt of a weak acid and a strong hydroxide undergoes hydrolysis and OH^- ions are formed, which causes the raspberry color. The aqueous solution of sodium oleate is alkaline.

Level: Secondary School