Worksheet:

How to carry out Fearon’s test on methylamine with dairy products?

1. Preparation

A) Bring some of your commonly-used dairy products to class, e.g. whole milk (cow’s milk), lactose-free milk, buttermilk, kefir, natural yogurt, dairy-based coffee creamer, and sour cream. These products should be as natural as possible, as adding of colorants or sugars such as fructose and glucose would distort the results of the experiment.

B) For the whole class, prepare one batch of Fearon’s reagent by dissolving 0.84 g methylammonium chloride and 5 g sodium hydroxide in demineralized water and make up the volume to 500 mL (alternatively 500 mL of a 10% ammonia solution with 5 g NaOH).

C) Use a (smartphone) camera to document all important steps and possible color changes.

2. Necessary reagents

Different dairy products as mentioned above, Fearon’s reagent, demineralized water, lactose, fructose, glucose, galactose, sucrose.

3. Necessary equipment

A thermometer to measure 70 °C (158 °F); a hot plate (if possible with temperature control), a 1 L beaker filled with approximately 300 mL of demineralized water (water bath), test tubes, test tube holder, test tube rack, waterproof pen for labeling the test tubes, disposable pipettes.

4. Method

- In a 1 L beaker heat 300 mL of water to 70 °C (158 °F).
- Label the test tubes according to the different dairy products to be used.
- Pipet 2 mL of each dairy product into the corresponding test tube with disposable pipettes (depending on the viscosity of the dairy products, the tips of the disposable pipettes might need to be slightly shortened to allow for a larger opening).
- For comparative purposes, prepare five blank tests by dissolving 40 mg each (approximately the tip of a small spatula) of lactose, fructose, glucose, galactose, and sucrose in 2 mL demineralized water. Remember to label these test tubes as well.
- Add 2 mL of the prepared Fearon’s reagent to each test tube and shake each test tube carefully but thoroughly so that everything mixes well.
- Place the test tubes into the hot water bath and leave them there for a minimum of 10 and maximum of 20 minutes (if 10% ammonia solution is used instead of methylammonium chloride: a minimum of 15 and maximum of 30 minutes) until the resulting colors are clearly visible.
- After that, all test tubes are removed from the water bath and lined up in a tube rack.