



Fehling Solution No. 1

R037

Intended use

Fehling's test can be used to screen for glucose in urine, thus detecting diabetes. Another use is in the breakdown of starch to convert it to glucose syrup and maltodextrins in order to measure the amount of reducing sugar, thus revealing the dextrose equivalent (DE) of the starch sugar.

Composition**

Ingredients

Copper sulphate, pentahydrate (CuSO ₄ , 5H ₂ O)	7.0 gm
Distilled water containing 2 drops of H ₂ SO ₄	100.0 ml

**Formula adjusted, standardized to suit performance parameters

Directions

1. Mix 15 ml of Fehling solution no.1 with 15 ml of Fehling solution No.2
2. Add 2 ml of this mixture to an empty test tube.
3. Add 3 drops of the specimen to be tested to the tube.
4. Place the tube in a water-bath at 60°C.

Principle And Interpretation

The principle behind Fehling test is basically based on the reducing property of monosaccharide and disaccharides, which in turn depends on the presence of free keto or an aldehyde group. This test is performed by adding a few drops of sugar solution to a mixture of Fehling's No.1 solution (i.e., CuSO₄) and Fehling's No.2 solution (i.e., NaOH and Potassium tartarate).Fehling's solution gets reduced by aldose sugars to insoluble yellow or red colored cuprous oxide. Monosaccharides like glucose, galactose and fructose and disaccharides like lactose and maltose can be detected to Fehling's test as they possess a free keto or an aldehyde group, whereas sucrose cannot be detected by the test as it does not possess a free aldehyde or a keto group. Hence, Fehling's test is also used to distinguish reducing disaccharides like maltose from non-reducing sugars like sucrose.

Type of specimen

Clinical : Urine

Specimen Collection and Handling

1. For clinical samples follow appropriate techniques for handling specimens as per established guidelines

Warning and Precautions

In Vitro diagnostic use only. Read the label before opening the container. Wear protective gloves/protective clothing/ eye protection/face protection. Follow good microbiological lab practices while handling specimens and culture. Standard precautions as per established guidelines should be followed while handling clinical specimens. Safety guidelines may be referred in individual safety data sheets.

Limitations

1. Aromatic aldehydes cannot be detected using Fehling test.
2. This reaction takes place in alkaline environment only. If the mixture is acidic, the copper (II) ions would be stabilized and not easily oxidized. Then, the reaction would be failed. Alcohols and aldehydes would give the positive result also, because they can present the similar reducing group.

Performance and Evaluation

Performance of the medium is expected when used as per the direction on the label within the expiry period when stored at recommended temperature

Quality Control

- **Appearance** : Light blue coloured solution.
- **Clarity** : Clear without any particles.
- **Results** : Standardized Fehling solution No.1 (R037) when used with Fehling solution No.2 (R038) for sugar estimation gave results in expected range of known sugar standards.

Storage and Shelf Life

Store between 10-30°C in tightly closed container and away from bright light. Use before expiry date on label. On opening, product should be properly stored in dry ventilated area protected from extremes of temperature and sources of ignition. Seal the container tightly after use.

Disposal

User must ensure safe disposal by autoclaving and/or incineration of used or unusable preparations of this product. Follow established laboratory procedures in disposing of infectious materials and material that comes into contact with clinical sample must be decontaminated and disposed of in accordance with current laboratory techniques.

Reference

1. Lab Manual in Biochemistry: Immunology and Biotechnology. Tata N. Biochemistry, 23, (2007)
2. Elementary Practical Organic Chemistry: Quantitative Organic Analysis Part 3. Vogel A. Science, 743-744
3. Isenberg, H.D. Clinical Microbiology Procedures Handbook. 2nd Edition.
4. Jorgensen, J.H., Pfaller, M.A., Carroll, K.C., Funke, G., Landry, M.L., Richter, S.S and Warnock, D.W. (2015) Manual of Clinical Microbiology, 11th Edition. Vol. 1.
5. Lapage S., Shelton J. and Mitchell T., 1970, Methods in Microbiology', Norris J. and Ribbons D., (Eds.), Vol. 3A, Academic Press, London.
6. MacFaddin J. F., 2000, Biochemical Tests for Identification of Medical Bacteria, 3rd Ed., Lippincott, Williams and Wilkins, Baltimore.



Storage temperature



Do not use if package is damaged



In vitro diagnostic medical device



CE Marking



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