

جامعة الانبار

كلية : الصيدلة

قسم : فرع العلوم المختبرية السريرية

اسم المادة باللغة العربية: الكيمياء الحياتية

اسم المادة باللغة الإنكليزية: Biochemistry I

المرحلة: الثالثة

التدريسي: المدرس المساعد زهير عبدالستار احمد

عنوان المحاضرة باللغة العربية: تجربة اختبار السيستين والسيستائين


عنوان المحاضرة باللغة الإنكليزية: Test for cystein and cystine and

Xanthoproteic Reaction



Assistant Lecturer. Zuhair A. ALrawi

***College of Pharmacy
third level***



practical lab.(6) (proteins)



6- Test for cystein and cystine:

Cysteine is a non-essential sulfur-containing amino acid in humans, related to cystine.

- Cysteine is important for protein synthesis and collagen production .
- detoxification, and diverse metabolic functions.
- Cysteine is a component of the **antioxidant glutathione**.



Test for cystein and cystine:

Cystine is a sulfur-containing amino acid obtained by the oxidation of two cysteine molecules which are then linked via a **disulfide** bond.

Principle:

This will convert the organically combined sulphur of **cystein** and **cysteine** into **sodium sulphide**. When add a drop of **lead acetate** solution, **black** or **brown** colour appears due to the formation pf **lead sulphate**.



Test for cystein and cystine:

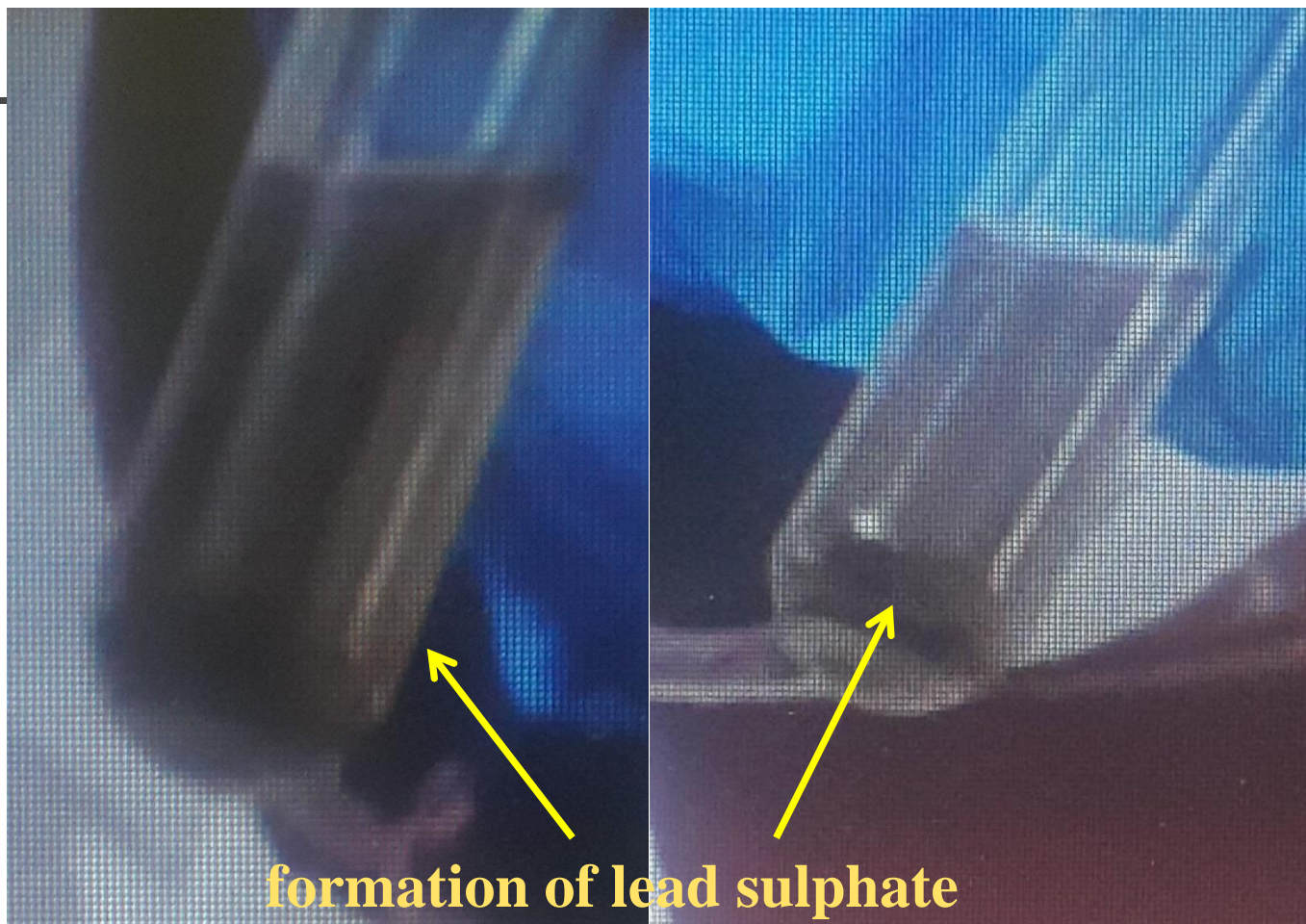
Method:-

- 1ml protein solution + 1ml of 40% NaOH and boil for not less than one minute.

Cool the tube and add 3 drops of concentrated acetic acid (CH_3COOH) .

- add a drop of lead acetate solution $\text{Pb}(\text{CH}_3\text{COO})_2$.
- formation black or brown colour of lead sulphate.

Test for cysteine and cystine



Cystein & cystine + 40%NaOH $\xrightarrow{\text{boil}}$ Na₂S $\xrightarrow{\text{Lead acetate}}$ PbS



7- Xanthoproteic Reaction :

This test is general for proteins, because it is positive with aromatic amino acids (**aromatic groups**) that contain a benzene ring in their composition, as protein is not devoid of those acids.



Xanthoproteic Reaction :

Principle:

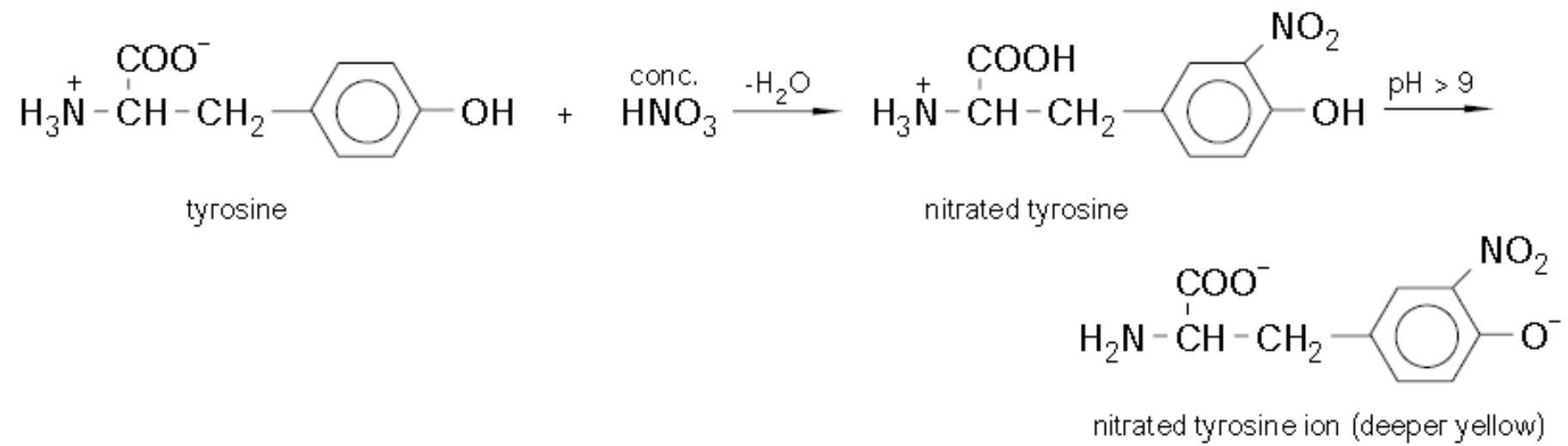
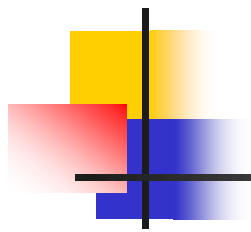
- This detector is based on the presence of benzene compounds, when **heated** with **conc. HNO₃**, the nitration process of the benzene ring in the amino acid occurs, to give a **yellow precipitate**, and because the resulting nitro compounds are yellow in color, so the detection is called xantoproteic. (Yellow = xantho). When alkali is added to these nitro-derived salts, the color changes from **yellow** to **orange**.



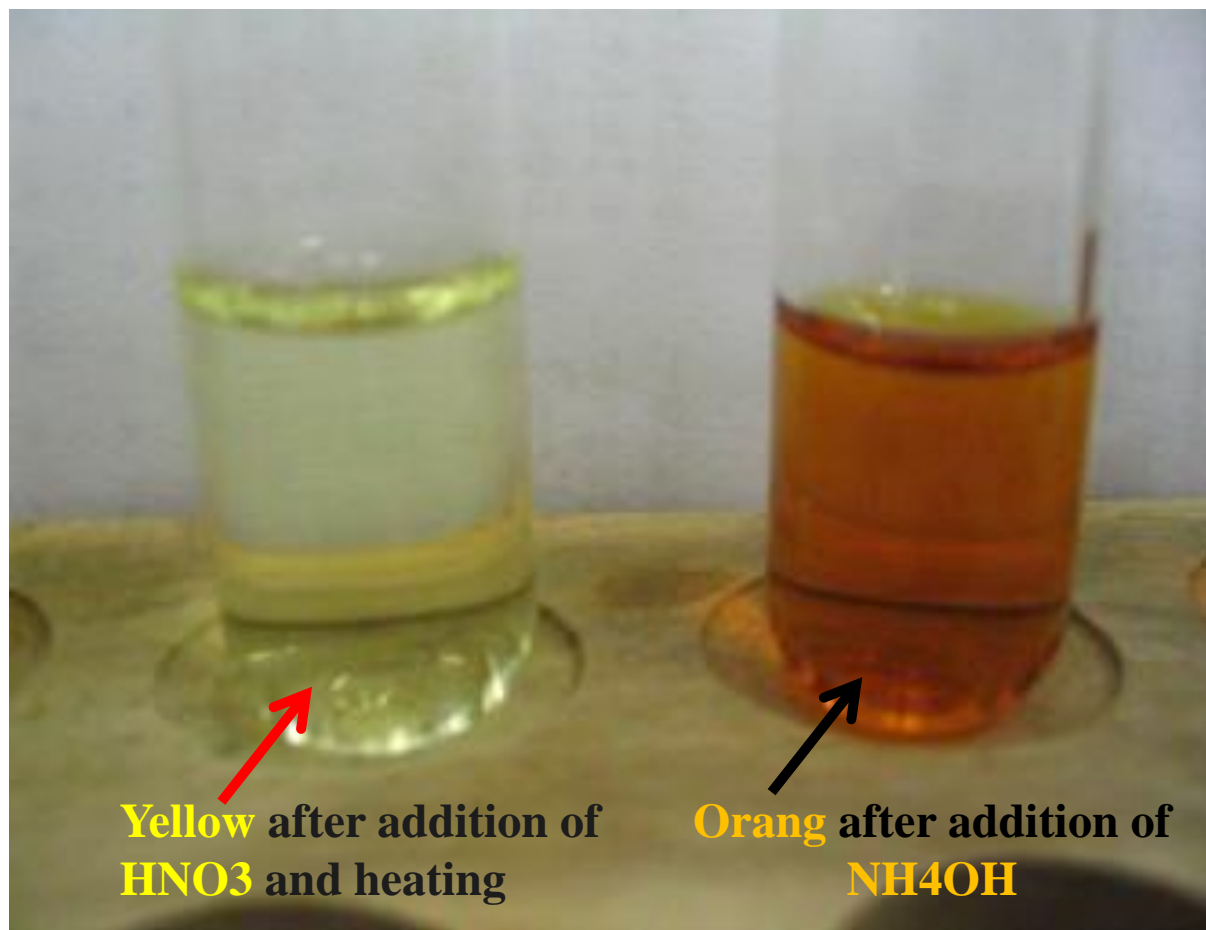
Xanthoproteic Reaction :

Procedures:-

- Take 2ml of **tryptophan amino acid** solution in dry test tube + 1ml of con. **Nitric acid (HNO₃)** and mix well.
- The mixture was heated in a boiling water bath for (1-2 minutes). A **yellow precipitate** is formed, then left to cool.
- add 10 drops of Con. **NH₄OH or NaOH** for test tube, become **orange**.



Xanthoproteic Reaction





thank you for
listening