AL-RASHEED PHARMACY Dpt.

3rd year-1st trimester 2021 Biochemistry lab

Lab 7 Lead acetate Test Protein review

Definition

Lead sulfide test (or Lead acetate test) is a biochemical test for the detection of <u>amino</u> <u>acids</u> like cysteine and cystine. The test is a specific test for the detection of amino acids containing sulfur, S-S group in cysteine, and S-H group in cystine. The test is also called a lead acetate test as the reagent for the test is lead acetate. Even though the test is specific for the detection of sulfur-containing amino acids, methionine doesn't give a positive result in this test. why?

Structures of sulfur-containing amino acids



Objectives of Lead acetate Test

- To detect the presence of sulfurcontaining amino acids in a sample.
- To detect <u>protein</u>-containing cysteine and cystine in a given sample.
- To distinguish between sulfur-containing and non-sulfur containing amino acids.

Principle of Lead acetate Test

The test is based on the principle of detection of sulfur in a solution by the degradation of the S-H or S-S group in amino acids under strongly alkaline conditions. Amino acids like cysteine and cystine release sulfur in the presence of strong alkaline conditions at a high temperature. The sulfur then combines with the alkali (NaOH) to form Na2 The Na2S thus formed reacts with lead acetate to form lead sulfide, which results in a black preciptate.

Reaction

Cysteine + 2NaOH \rightarrow Serine + Na₂S + H₂O $Pb(CH_3COO)_2 + NaOH \rightarrow Pb(OH)_2 +$ 2CH₃COONa $Pb(OH)_2 + 2NaOH \rightarrow Pb(ONa)_2 + 2H_2O$ $Na_2S + Pb(ONa)_2 + H2O \rightarrow$ precipitate) + 4NaOH

PbS (black

Procedure of Lead acetate Test

- In a test tube, 2 ml of the amino acid solution is taken. To this, 2 ml of NaOH is added, and the solution is boiled for a minute.
- Once the test tube cools down, a few drops of lead acetate are added to the solution.
- The test tube is then observed for the formation of a precipitate.

Interpretation of Lead acetate Test

Lead Sulfide Test- Definition, Principle, Procedure, Result, Uses

Lead Sulfide Negative Test

Black precipitate absent

Sulfur-containing amino acids absent (cysteine or cystine) Lead Sulfide Positive Test

Black precipitate present

Sulfur-containing amino acids present (cysteine or cystine)

Results

- **Positive test:** A positive test in the Lead sulfide test is represented by the formation of black precipitate at the bottom of the test tube. This indicates the presence of cysteine or cystine in the solution.
- Negative test: A negative result in the Lead sulfide test is represented by the absence of black residue in the test tube. This indicates the absence of cysteine or cystine.

Protein Test review



End

THANK YOU FOR LISTINING Prepared by: Assis.Lect.Nabigh Al-SHARIFI