SER: Blood (Presumptive) – Kastle-Meyer

Principle

This test relies on the peroxidase-like activity of the heme-group in red blood cells, which catalyzes the reduction of hydrogen peroxide. The reduction of hydrogen peroxide releases oxygen which oxidizes phenolphthalin (colorless reduced form) to phenolphthalein, which turns a pink color.

Equipment and supplies

This procedure uses the following laboratory equipment and supplies:

- analytical balance
- magnetic stir bar
- hot plate and stirrer
- swabs

Reagents

This procedure uses the following reagents:

- Kastle-Meyer
  - 2.0g phenolphthalein
  - 20.0g potassium hydroxide
    - Mix the above chemicals with 100 mL of deionized water and reflux with 20.0g of powdered zinc until the solution becomes colorless. Dilute the solution with 400 mL ethanol. Store refrigerated (2-8°C) in a dark bottle with a small amount of zinc metal added.
- 3% Hydrogen peroxide (store at 2-8°C)

Quality control

The *Kastle-Meyer* reagent must be quality control tested each day before use with a positive control (known bloodstain) and a negative control (water). Results of these tests are recorded in the examination documentation.

Records

Records documenting the preparation and quality control testing of the reagent will be kept in the *Biology Quality Control Log Book.*

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SER: Blood (Presumptive) – Kastle-Meyer, Continued

Procedure

Use the following procedure to perform the Kastle-Meyer test.

Step	Action
1	Moisten a swab with distilled water and rub over the suspected bloodstain or cut out a small portion of the stain and place on filter paper. NOTE: For weak stains, add a drop of ethanol to the swab or cutting to enhance the sensitivity of the test.
2	Add a drop of the *Kastle-Meyer* reagent. NOTE: A pink color at this step indicates an inconclusive result. The test should be discontinued.
3	Add a drop of 3% Hydrogen peroxide.

Interpretation

The rapid development of a pink color after the addition of the hydrogen peroxide is a positive (+) result and indicates the presence of blood. This test is very sensitive but not specific.

False positives can be caused by
- chemical oxidants and catalysts
  – which give a color change prior to the addition of the hydrogen peroxide
- plant material containing peroxidase

The absence of the pink color is a negative (-) result for the presence of blood.

References

The following references were used in the development of this procedure.

Biology Methods Manual, Metropolitan Police Forensic Science Laboratory, 1978.

Lee, H., "Identification and Grouping of Bloodstains," *Forensic Science Handbook*, Ed. R. Saferstein, New Jersey: Prentice Hall, 1982.

Technical and Legal Aspects of Forensic Serology: A Laboratory Manual Federal Bureau of Investigation.