SER: Seminal Fluid - Acid Phosphatase Spot Test

Principle
Acid phosphatase (AP) is an enzyme that is secreted by the prostate gland into seminal fluid. Its concentration in seminal fluid is up to 400 times greater than that found in other body fluids.

A positive reaction for the test is the formation of a purple color within 60 seconds, thereby indicating the presence of acid phosphatase.

Supplies
The following supplies are used in this procedure:

- filter paper
- cotton swabs
- glass plates
- timer

Reagents
This procedure uses the following reagents:

- AP Spot Test reagent
  - Dissolve 0.26 grams of SERI Acid Phosphatase Spot Test PMR in 10 mL of deionized water. This solution must be made fresh prior to use.

Record the lot number and expiration date of the reagent in the examination documentation.

Quality control
The AP Spot Test reagent must be quality control tested before each use with

- a positive control (semen or seminal stain)
- a negative control (water)

The results of this test, including the approximate time required for the color reaction to occur, are recorded in the examination documentation.

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Overlay procedure

Use the following procedure to perform the AP overlay spot test for transferred stains.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Moisten a suitably sized piece of filter paper with deionized water.</td>
</tr>
<tr>
<td>2</td>
<td>Lay the filter paper over the suspected stain to transfer it to the filter paper. Maintain good contact for at least 1 minute. A glass or plastic plate and weight can be applied to ensure proper contact. Mark seams or other reference points for orientation.</td>
</tr>
<tr>
<td>3</td>
<td>After removing the filter paper from the evidence item, apply the AP Spot Test reagent until the filter paper is saturated.</td>
</tr>
<tr>
<td>4</td>
<td>Set timer and record the development of any color reaction that occurs within 60 seconds.</td>
</tr>
</tbody>
</table>

Direct procedure

Use the following procedure to perform the AP Spot Test directly on samples.

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Moisten a piece of filter paper or a sterile test swab with deionized water.</td>
</tr>
<tr>
<td>2</td>
<td>Apply the filter paper or test swab from Step 1 directly onto the item to be tested.</td>
</tr>
<tr>
<td>3</td>
<td>Add a drop of AP Spot Test reagent to the filter paper or test swab.</td>
</tr>
<tr>
<td>4</td>
<td>Set timer and record the development of any color reaction that occurs within 60 seconds.</td>
</tr>
</tbody>
</table>

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Interpretation

The development of a purple color within 60 seconds is a positive (+) result for the presence of acid phosphatase.

The absence of a color reaction within 60 seconds is a negative (-) result for the presence of acid phosphatase.

Acid phosphatase is present in seminal fluid in high concentrations; however, it is also present in other body fluids at lower concentrations and in plants, fungi, and bacteria. Seminal stains tend to give a faster and stronger reaction than other sources.

Since acid phosphatase is not unique to seminal fluid, the AP Spot Test is a presumptive test only.

A negative reaction does not necessarily mean that semen or other components of seminal fluid are not present. Further testing for the presence of spermatozoa, p30, or semenogelin may be conducted.

References

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


Forensic Examination of Sexual Assault Evidence Training Manual, California Criminalistics Institute, California Department of Justice, 1992.