

# TENNESSEE BUREAU OF INVESTIGATION

## Forensic Services Division

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### Violent Crime Response Team Standard Operating Procedures

#### Small Particle Reagent

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## 10. VCRT Procedures

### 10.11 Small Particle Reagent (SPR)

#### 10.11.1 Scope

In the Small Particle Reagent (SPR) process, the very small black particles, Molybdenum Disulfide ( $\text{MoS}_2$ ), adhere to the fatty substances left in latent print residue. SPR is known for developing latent prints on wet items and can either be sprayed or immersed using a bath method. SPR may also be used after processing the evidence with cyanoacrylate. Once processed with cyanoacrylate, SPR may adhere to faint impressions more effectively than powders.

SPR may be used to process non-porous items, previously wet surfaces, and incendiary bottles. SPR may also be used after cyanoacrylate if dye stains are ineffective. It is also recommended for beverage containers with surfaces having residue on sides, where the application of regular powders could ruin a brush or destroy a latent print.

Small particle reagent is primarily used on semi-porous and non-porous surfaces.

#### 10.11.2 Definitions

Refer to the VCRT 11.0 Definitions and Abbreviations

#### 10.11.3 Chemicals and Reagents

Molybdenum Disulfide ( $\text{MoS}_2$ )  
Tap water  
Kodak Photo Flo-200

#### Mixing Procedure

1. Pour one (1) L of water into a half-gallon bottle.
2. Add one bottle (30 g) of Molybdenum Disulfide ( $\text{MoS}_2$ ) to the water.
3. Two (2) or three (3) drops of Kodak Photo Flo-200 is then added to enable Molybdenum Disulfide powder to be mixed into the solution. Do not add any extra Photo Flo as it may make the reagent ineffective.
4. Place top on bottle and mix or shake until saturated. Three (3) to five (5) minutes may be required on the first mixing.

#### Shelf Life



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Prepare for each crime scene as needed and discard remaining SPR.

#### **10.11.4 Equipment and Supplies**

Spray bottles  
Dark half-gallon bottle with top  
Funnel  
Shallow tray

#### **10.11.5 Test Procedure**

##### Control

One or more latent prints are placed on a comparable non-evidence item. SPR is applied to the item(s) for ridge detail development to determine if adequate results are achieved.

A positive result occurs with the development of dark colored friction ridges.

A negative result occurs when no ridge detail or color change develops after application.

A control must be performed each time SPR is prepared and documented in notes.

A control must be successfully performed before applying SPR to evidence. This control must be documented in the VCRT member's notes.

##### Spray Method

1. Shake the SPR working solution thoroughly.
2. Using the funnel fill one of the spray bottles.
3. Place clean tap water in the second spray bottle.
4. Spray the SPR working solution onto the areas of the evidence to be processed for latent prints.
5. Shake frequently between sprays to keep SPR from settling.
6. Using the second spray bottle containing tap water, rinse the area just tested.



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7. Watch for the separation of the latent prints from the background.

#### Immersion method

1. Use the half-gallon mixing jar or shallow tray large enough to immerse the evidence in the SPR solution.
2. Shake the SPR working solution thoroughly just prior to immersing the evidence.
3. Immediately place evidence in SPR working solution. Do not agitate while evidence is immersed.
4. Leave in SPR working solution long enough for the SPR particles to settle on the evidence, usually two (2) or three (3) minutes.
5. Carefully remove evidence and rinse gently with tap water or lay the evidence facedown in a tray of water.
6. Examine for latent print development.
7. Repeat Steps 2, 3, 4, 5 and 6 until desired ridge detail develops or when it is determined that no ridge detail is obtainable.

Wiping the dried SPR from an item may reveal latent prints not previously visualized.

#### **10.11.6 Precautions**

Add only 2 or 3 drops of Photo Flo. The Photo Flo helps the SPR to go into suspension; however, too much Photo Flo will make the reagent ineffective. This is indicated when a large amount of foam is floating on the surface of the working solution.

Gloves and safety glasses are recommended. SPR is very messy, so over-spraying and excessive application should be avoided. Newspapers or other protective coverings are suggested to help in cleanup. Soap and water are usually adequate to clean up any stains.

#### **10.11.7 Interpretation of Results**

The results of this test (both positive and negative) will be recorded in the VCRT member's notes.

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Latent prints of comparable value should be marked and photographed with a ruler included. Refer to VCRT 10.34 Comparison Photography for additional information.