2.2.1 Scope

In the Small Particle Reagent (SPR) process, the very small black particles, Molybdenum Disulfide (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 (Super Glue). Once processed with cyanoacrylate, SPR may adhere to faint impressions more effectively than powders.

2.2.2 Evidence

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 residue on sides, where the application of regular powders could destroy a latent print.

2.2.3 Safety Precautions/Limitations

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.

2.2.4 Chemicals/Reagents

Molybdenum Disulfide (MoS_2)
Tap water
Kodak Photo Flo-200

2.2.5 Instruments/Equipment

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

2.2.6 Preparation

SPR can either be prepared in the laboratory or purchased.

1. Pour one (1) L of water into a half-gallon bottle.
2. Add one bottle (30 g) of Molybdenum Disulfide (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.

2.2.6.1 Storage

Purchased SPR shall remain in the manufacturers packaging.

2.2.6.2 Shelf Life

Prepare as needed and discard remaining SPR.

2.2.7 Controls

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 the Reagent Logbook.

A control must be successfully performed before applying SPR to evidence. This control must be documented in the Reagent Logbook as well as the examiner's notes.

If at any time a control test indicates that the product is not working properly, the examiner or technician performing the control will properly

dispose of that bottle, open or prepare a new bottle, and test a new control. Once the control tests appropriately, the SPR may be used.

2.2.8 Procedure

2.2.8.1 Method One

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

2.2.8.2 Method Two

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.

2.2.8.3 Deviation from Protocol

A variation in the above procedure may be performed with supervisor approval.

2.2.9 Interpretation of Results

Latent prints of comparable value shall be photographed with a ruler included or lifted. Refer to 2.5.2 and 2.5.5 of the Forensic Imaging Standard Operating Procedures Manual for further instruction.

2.2.10 References

CBDIAI. “Small Particle Reagent – (S.P.R.).” http://www.cbdiai.org/Reagents/spr.html

Lee, H.C. & Gaensslen, R.E. (1994). Methods of Latent Fingerprint Development. In H.C. Lee & R.E. Gaensslen (Eds.), *Advances In Fingerprint Technology*. (First Edition, 82-83) Boca Raton, FL: CRC Press.

Shelef, R. et al. Development of Latent Fingerprints from Incendiary Bottles *Journal of Forensic Identification* 46(5)1996. pp. 556-569.