LIGHTNING®
POWDER COMPANY, INC.

1230 Hoyt Street SE
Salem, Oregon 97302
Tel. 503-585-9900 or 800-852-0300
FAX 503-588-03-98 or 800-588-03-99
e-mail: info@redwop.com www.redwop.com

Technical Note No. 1-2757
April 2000

Small Particle Reagent

TECHNICAL NOTES

Introduction

Small Particle Reagent (SPR) is another name for Molybdenum Disulfide (MoS_2), which is difficult to say. Small Particle Reagent is a physical development technique where small black particles adhere to the fatty substances left in fingerprint residue. This solution has been used successfully on paper, cardboard, new metal, rusty metal, bricks, rocks, concrete, plastic, vinyl, wood, galvanized metal, and glass. However, just as with any latent print development process, the results depend upon the amount of residue deposited by the finger.

Small Particle Reagent is most well known for its ability to develop latent prints on wet surfaces, such as vehicles wet with rain or even recovered from a lake or pool. This solution can even be used underwater, as long as the spray bottle has sufficient force to propel it through the water. It can be used on surfaces having a residue, such as soda pop running down the side of a can. Trying to apply regular powder to the item could damage the latent print brush and/or ruin the latent print.

Safety

As with all chemicals, always read the MSDS (material safety data sheet) to learn about the safe handling and health hazards of each chemical. With Molybdenum Disulfide (MoS_2), it is recommended that rubber gloves and safety glasses be worn. While this chemical is very messy to use, soap and water are generally adequate for cleanup. However, if the Small Particle Reagent is used on a surface and left on it for a period of time, generally a few months, it may leave a stain.

SPR Master Kit

Several items are needed to use and mix Small Particle Reagent. They are available in the SPR Master Kit. The list of items is as follows.

5 jars - Molybdenum Disulfide (MoS_2), 30 grams each
2 each - spray bottles
1 each - half-gallon bottle for stock solution and/or dipping
1 each - Kodak Photo Flo-200
5 pair - vinyl gloves
1 each - Gritz® waterless hand cleaner, 16 oz.
1 each - funnel
1 each - comprehensive instructions

Mixing Instructions

Measure one liter of water into the half-gallon bottle. Distilled water is preferred, but ordinary tap water should work well in most areas. We suggest you test both.

Add one bottle (30 grams) of Molybdenum Disulfide (MoS_2) to the liter of water. Add 2 or 3 drops of Kodak Photo Flo-200 to enable the Molybdenum Disulfide powder to mix into solution. **Do not add extra Photo Flo.** The purpose of adding Photo Flo is to help the Small Particle Reagent to go into suspension. However, larger amounts of Photo Flo will make the reagent ineffective.

Put the lid on the bottle and shake this mixture until the powder is thoroughly wetted. No powder should remain floating on the surface. When first mixed, the solution may require continuous agitation for three to five minutes. If the suspension has a large amount of foam floating on the surface, too much Photo Flo was added and it may be necessary to discard this solution and start over with a new quantity of Molybdenum Disulfide.

The shelf life of the working solution of Small Particle Reagent is about four weeks. After that time, the suspension may not work and should be discarded.

Processing Instructions

There are two ways to apply Small Particle Reagent to evidence. It can be sprayed onto a surface using a pump-spray bottle or a compressed-air spray system. Small Particle Reagent can also be used as a dip for smaller pieces of evidence.

For the spraying method, shake the stock solution thoroughly and, using the funnel, fill one of the spray bottles. Fill the other spray bottle with clean water. Spray the Small Particle Reagent solution onto the area to be searched for latent prints. The surface can be wet or dry. Shake the bottle between sprays, as the particles of Molybdenum Disulfide (MoS_2) tend to settle rapidly. Please remember that Small Particle Reagent is very messy so over-spraying should be avoided and newspapers or other protective covering should be used to aid in the clean up measures.

Using the other spray bottle with clean water, rinse the area just tested and watch carefully for the "separation" of the water from an area with latent prints. This separation is similar to the action observed when spraying water on a surface having a grease spot.

The half-gallon mixing jar can be used to dip small items or use a baking dish or a photographic tray for documents, etc. Shake the solution thoroughly and immediately immerse the evidence so that the particles of MoS_2 settle on the surface of the evidence where latent prints are suspected. Many pieces of evidence will have to be immersed twice, once for each side. **Do not agitate the solution while the evidence is immersed.** Immerse for two to three minutes, then carefully remove the evidence and either rinse **gently** with clear water or float the evidence face down in a tray of clear water.

Recovery of Latent Prints

Similar to the results when using Bi-Chromatic™ powder, latent prints developed with Small Particle Reagent will appear as dark gray on light-colored surfaces and as light gray on dark-colored surfaces. Sometimes, ridge detail will be barely visible until the print is lifted.

Latent prints developed with Small Particle Reagent can be lifted after they are dry. **However, it is strongly recommended that developed latent prints should be photographed before any attempt is made to lift them.** If time and circumstances allow, let the background and latent prints dry before lifting. Using a hair dryer to accelerate the drying process is **not** recommended.

Experiments have been done to show lifts of latent prints can be made while the surface is still wet by using clear latent print lifting tape. However, this process may destroy the latent prints due to the creation of water spots under the tape. It is recommended that each technician practice lifting these types of latent prints on non-evidence items before working with actual evidence on case work.

Additional Reading

Advances in Fingerprint Technology edited by Dr. Henry Lee and Dr. R. E. Gaensslen
Manual of Fingerprint Development Techniques by the British Home Office, second edition

Ordering Information

Catalog No. 1-2750 ..... SPR Master Kit
Catalog No. 1-2751 ..... Small Particle Reagent, 30 grams, 1-pack
Catalog No. 1-2755 ..... Small Particle Reagent, 30 grams, 5-pack
Catalog No. 1-2756 ..... Small Particle Reagent, 30 grams, 10-pack
Catalog No. 8-5015 ..... HOME OFFICE/*Manual of Fingerprint Development Techniques,* 2ND edition
Catalog No. 8-5041 ..... LEE/*Advances in Fingerprint Technology*

Prepared by Kathleen D. Saviers, CLPE, CSCSA