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TECHNICAL INFORMATION

Luminol

Catalog Nos. LUMINOL4, LUMINOL8, LUMINOL16

Application	Presumptive test for the presence of blood. Very useful in searching large areas for traces of blood, especially if the area was supposedly cleaned (1:1,000,000 sensitivity). Not recommended for use on visible or wet blood.

Information

Luminol is a versatile chemical that exhibits chemiluminescence, with a striking BLUE-WHITE glow, when mixed with an appropriate oxidizing agent. It is a white to slightly yellow crystalline solid that is soluble in water and most polar organic solvents.

Luminol reacts with the iron present in hemoglobin to reveal even the most minute traces of blood left at crime scenes—even if it's been cleaned and there are no visible signs of a crime. In fact, the older the blood stain, the more intense the reaction will be.

Preparation Instructions

Warning! Luminol, in its solid or mixed state, is hazardous and should be mixed in a well-ventilated area or laboratory hood. Severe skin, eye and respiratory irritant—wear protective clothing.

Caution! Luminol has a relatively short shelf life and should be prepared at the crime scene.

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Tools Required	• Luminol reagent (Nos. LUMINOL4, LUMINOL8, LUMINOL16) • Nitrile gloves • Safety glasses • Night vision flashlight—red beam (No. LVL100 LumaVision™) • Camera • Photo scales • Optional: Photo evidence markers (No. PEN15)	
Hazards/Safety Info	H M I S H 2 F 1 R 0 PP E	**Warning!** Oxidizer—harmful if swallowed, inhaled or absorbed through skin. Severe irritation with possible burns to respiratory/digestive tract, skin and eyes. Avoid eye and skin contact. Use of nitrile or latex protective gloves, safety glasses, synthetic apron, and vapor respirator are recommended. Use in well-ventilated area or laboratory hood. For treatment due to contact, refer to the MSDS. *Go to www.sirchie.com and click on MSDS.* **Caution!** May be combustible at high temperatures. Keep away from heat, open flames and ignition sources.

1. Remove cap from bottle of "B" solution.
2. Remove clip and pour entire contents of pouch "A" powder into bottle of "B" solution.
3. Recap bottle with supplied spray head attachment and shake well until all solid material dissolves.
4. Luminol is ready to be applied to suspect areas.

Application Instructions

Warning! Luminol using the trigger spray head attachment must be set on *MIST,* not *stream*, so as not to disturb prints or destroy patterns in the blood.

Caution! Luminol is not recommended for use on visible or wet blood.

Blood evidence is often found in and around the following, but is not limited to: sinks, tubs, drains, toilets, wood and tile floors, carpet, buckets, mops, wash cloths, towels, bedding, ceilings, walls, door handles, kitchen utensils, etc. **Note:** Luminescence is somewhat fleeting—have a camera positioned near area being sprayed to record evidence through time-lapse photography.

1. Photograph the scene prior to processing with Luminol.
2. Turn off all lights and darken the area as much as possible—luminescence may be very weak and is best seen in total darkness. **Note:** A night vision flashlight (red beam) such as LVL100 LumaVision™ may be used to illuminate the area (shown to the right) while processing the scene.
3. Process small 2-3 sq. ft. areas at a time. When luminescence is revealed, extinguish the red light and take time-lapse photos (absolutely no flash is to be used). **Notes:** Photo Evidence Markers such as PEN15 can be used to indicate the locations of luminescence so they can later be photographed under full light or with a flash.
4. Reapply Luminol as necessary if luminescence fades too quickly before photos can be taken.

Special Note: Chlorine bleach gives off a very bright flash when Luminol is applied and can be indicative of efforts to clean up blood evidence. Other false positives for Luminol include iron and copper particles. Luminol is a blood search tool, and suspected blood areas must be confirmed with a subsequent testing. Luminol may interfere with some subsequent tests, but it has been shown, however, that DNA extraction from Luminol treated samples is possible.

Alternate Processes: As Luminol should not be used on visible blood, an alternate process such as Amido Black (LV501) or Leuco-Crystal Violet (LV509) can be used to enhance latent prints contaminated with blood on porous and non-porous surfaces with a visible colored stain. And in the determination for the presence of blood, presumptive tests such as Phenolphthalein (DCB100) and Leucomalachite (DCB200) DISCHAPS™ have proven successful.

Interpretation Instructions

Review Method

Luminol is not a specific test for blood, but rather a method in the determination for the possible presence of blood. Typically, luminol only shows investigators that there might be blood in an area, since other substances, including household bleach, can also cause the luminol to glow. Experienced investigators can make a reliable identification based on how quickly the reaction occurs, but they still need to run other tests to verify that it is really human blood.

Special Note: If surfaces to be treated are wet, allow them to dry completely before applying Luminol. The reagent should never be used on non-dried blood either.

Results Expected

A BLUE-WHITE luminescence will be visible in total darkness when reagent is applied.

BEFORE and AFTER shots of bloody shoe print on carpet.

Possible Reasons for Poor or No Results

1. No luminescence is viewed.
   - 1.1. No blood present.
   - 1.2. Luminescence is weak and the area/room was not adequately darkened.
   - 1.3. Solution is not fresh and has passed its life of effectiveness *(solution life is 45-60 minutes after mixing).*
   - 1.4. Unmixed reagent has exceeded normal shelf-life of one year from date of purchase.
2. False positive—no blood can be confirmed.
   - 2.1. Sources of copper or iron may have catalyzed the reaction.
   - 2.2. Household chlorine bleach may have catalyzed the reaction.
   - 2.3. Phenolphthalein dye may be present from a previous test.

Other Similar Products

Luminol in the DISCHAPS™ packaging form (DCB300) eliminates the possibility of reagent contamination and dramatically increases shelf life. As with the spray method, this presumptive test must be conducted in a darkened area to view the luminescence. Other presumptive tests for blood in DISCHAP™ packaging include DCB100 Phenolphthalein and DCB200 Leucomalachite. The sensitivity level is not as high as Luminol, but the tests do not require darkness to view the reaction.

References

1. Saferstein, Richard, PhD, **Criminalistics.** New Jersey: Prentice Hall; 1998, p370.
2. 3Dchem, “Chemiluminescence”, <http://www.3dchem.com/moremolecules.asp?ID=334>, April 2009.
3. How Stuff Works, “How Luminol Works”, Tom Harris, <http://science.howstuffworks.com/luminol.htm>, April 2009.