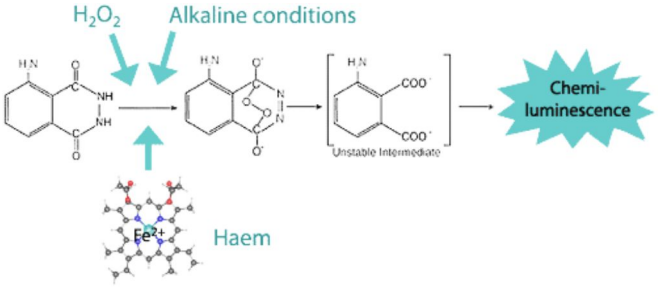
The Chemistry of Bluestar Forensic

A new Luminol based formula

BLUESTAR® FORENSIC is a blood visualizing agent, based on luminol, a molecule that is well-known amongst forensic criminologists. The constitution of BLUESTAR® FORENSIC has made it possible to eliminate inconvenient elements associated with other luminol-based reactive agents.



How does Luminol React ?

Luminol (3-Aminophthalhydrazide) was synthesized for the first time in 1853. Its property to produce a chemo-luminescent reaction in basic solution in the presence of an oxidizing agent on contact with blood was first observed by Albrecht in 1928.

The main components capable of catalyzing this reaction for emitting light are the transition metals haem and peroxidase. Haem is a biochemical structure that forms an integral part of peroxidase. This structure is equally present in hemoglobin. In this manner, the presence of hemoglobin – thus of blood – can be revealed by taking advantage of the ability of haem to catalyze the chemo-luminescent property of luminol. In other words, a mix of luminol + oxidizing agent + alkaline agent, when placed in contact with blood, will emit light.

From Luminol to Bluestar® Forensic: a brief history

The first experiments conducted with a view to using luminol as a tool in forensic sciences were conducted in 1937 by Specht, who tested it out on a variety of bases such as the lawn, bricks, or stone soaked in blood. In 1939, Proesher & Moody tested Specht's composition on animal and human blood.

In 1951, Grodsky proposed a blend of powders made up of luminol, sodium carbonate, and sodium perborate mixed with distilled water. This subsequently became the formula that is still used by today's investigators to detect traces of blood at the scene of a crime.

However, the use of sodium carbonate produces a slow reaction in the oxidization process of hemoglobin. It therefore is not very luminous and of brief duration only. Moreover, once the reactive agents dissolve in the water, the life of the solution obtained is very short. This formula is very unstable and is toxic, due to the presence of sodium perborate.

In 1966, Weber proposed a composition made up of luminol, sodium hydroxide or potassium hydroxide, hydrogen peroxide diluted in distilled water. The solution so obtained needs to be kept in a cool place away from direct light. Its lifespan is brief. The luminous reaction obtained by this composition can be photographed in total darkness, or filmed with a night-vision camera.

Confidentialité - Conditions

In 2000, Jean-Marc Lefebvre-Despeaux, president of BLUESTAR, charged Loic Blum, Ph.D., professor of bio-chemistry at the University Claude Bernard-Lyon and director of the enzymatic and biomolecular engineering laboratory (EMB2-UMR 5013 CNRS-UCBL) to find a new formula that would be luminol-based and eliminate all those numerous inconveniences. As a result, Blum discovered this new formula that was subsequently called BLUESTAR® FORENSIC.

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