

## Evidence on hand – fingerprinting with biochemistry

**Keywords:** Forensics, chemistry.

**Intro:** Fingerprinting is a well-known, time-honoured method for identifying suspects, as each suspect's fingerprints are unique. This method of detecting fingerprints capitalises on the amino acid secretions left by a suspect's fingers to gather fingerprints.

### Ninhydrin method for developing fingerprints

#### **Equipment:**

- Ninhydrin solution, 0.5% (w/v) in acetone, in a small spray bottle
- Zinc chloride ( $\text{ZnCl}_2$ ), 3% (w/v) solution, in a small spray bottle
- 2 cloth towels
- Steam iron
- UV light

#### **Method:**

1. Have the "suspect" handle or write on a handheld sheet of paper.
2. Using tongs/gloves to handle the paper so as not to pollute it with your own fingerprints spray the paper lightly with ninhydrin and allow to dry.
3. Place the paper between two towels, and iron the towels for 3-5 minutes with a hot steam iron set to "cotton".
4. Remove the upper towel. The finger prints should now begin to be visible. Spray the paper lightly with 3% zinc chloride to enhance the fingerprints.

**Safety:** Wear safety goggles. Ninhydrin is an irritant, and will stain skin purple, so wear gloves. Work in low-light conditions, in a fume cupboard or well-ventilated place.

**Science:** Ninhydrin reacts with free amino and carboxyl groups, both present in the proteins and polypeptides that are secreted in the sweat from your fingers. When ninhydrin is heated to over  $80^\circ\text{C}$ , it forms a visible blue-purple colour, indicating the presence of amino acids. When used on fingerprints that have touched a porous surface, it will highlight the individual ridges of a fingerprint by the amino acids in the sweat from the fingers, making the fingerprints visible.

**See also:** *Fingerprinting* by David A. Katz

*Manual of fingerprint development techniques* by Menzel, E.R of the Home Office, Scientific Research and Development Branch, London

*Forensic chemistry – using laboratory chemicals to reveal fingerprints –*

Buzzle.com - <http://www.buzzle.com/articles/forensic-chemistry-using-laboratory-chemicals-to-reveal-fingerprints.html>