

# Invisible Ink

© 2014 by Brad Fulton and TTT Press

File sharing or unauthorized duplication by any means without written consent of the author is a violation of U.S. copyright law.

# Invisible Ink

- A substance that is invisible upon application and can be subsequently restored.
- Three types of invisible ink:
  - Heat-released
  - Chemically-released
  - Fluorescing inks
- Some inks are permanently revealed while others fade back to invisibility.

# Invisible Ink

## Heat-released Inks:

- Any acidic liquid will turn dark when exposed to heat. The acid oxidizes (burns) more quickly than the paper.
- Lemon juice and vinegar are examples.
- Sugary liquids, soda pop, and milk will oxidize at low temperatures
- These are permanently revealed inks.

# Invisible Ink

## Chemically revealed Inks:

- Certain chemicals appear clear until mixed with other chemicals, then they change color
- Vinegar, lemon juice, and starches such as potatoes and bread turn color when exposed to a diluted iodine solution
- Phenolphthalein turns bright pink in the presence of ammonia.

# Invisible Ink

## Fluorescent Inks:

- Certain chemicals react differently in the presence of black light (ultraviolet light).
- Sunscreen, liquid dish soap, and bar soap will fluoresce

# Invisible Ink

- Invisible ink is the opposite of "disappearing ink" used in pranks. Disappearing ink is visible until exposed to the moisture in the air which makes it invisible.

# Invisible Ink

- Invisible inks have been used in espionage. A seemingly blank paper can be passed to another agent who knows how to reveal the message.
- The science of invisible inks is called steganography. It is often used in conjunction with cryptography - the science of codes.