



INVISIBLE INK



Invisible inks are used to send secret messages. Typically a secret message is hidden within an ordinary letter and can be revealed by the receiver using a known procedure. A secret message has the advantage over a coded message in that people intercepting the mail would have no idea that a message was being sent. A plausible cover is needed however to hide the secret message (a blank piece of paper would arouse suspicion!)

Invisible inks can also be used as a fun way to communicate secretly with friends. An ideal invisible ink should be easily made, imperceptible to any interception as well as easily and safely revealed. Invisible inks are normally non-greasy and not visible under UV light (a common screening method for post).

Commonly acids and bases are used as invisible inks, and these are subsequently revealed by indicators. Indicators are chemical compounds which are different colours when in contact with either acids or bases. Indicators are also used in chemistry to show when chemical reactions are finished.

In addition to indicators, heat can also be used to reveal messages. A substance applied to the paper burns at a lower temperature than the paper and the message is revealed.

Which Invisible Ink is Best – Lemon Juice or Bicarbonate of Soda?

1. Prepare your inks

Squeeze some lemon juice into a beaker. In a different beaker dissolve a teaspoon of bicarbonate of soda with a teaspoon of water. Stir well – it does not matter if it is not completely dissolved.

2. Create your picture or message.

Use different brushes to apply both the lemon juice and bicarbonate of soda solution to separate pieces of paper. It is important that you allow both to dry thoroughly before you reveal your messages. While you wait you can:

3. Make your indicator

Red cabbage contains a natural indicator (anthocyanins) which can be used to reveal messages. Mash the warm water and diced red cabbage in a pestle and mortar. You should get a dark purple solution. This will be your indicator.

4. Reveal your message

Apply your indicator over the top of the messages you originally created using a paintbrush. What happens? Which invisible ink is the best and why?

Wear Gloves

Questions

Why do the invisible inks work?

What properties are required for a good invisible ink?

Other things to try

If you want to make your own invisible ink you can also try the following

Milk
Apple or Orange Juice
White vinegar
Sugar solution

Try developing them with red cabbage (or grape juice) indicator, or if an adult is around try heating them and see what happens.

