

Making Invisible Ink



Science Film Festival Film

Checker Tobi and Our Planet's Secret

Introduction

Making invisible ink is a lot of fun, you can pretend you are a secret agent as you keep all your secret codes and messages hidden from others. All you need is some basic household objects and the hidden power of lemon juice. Milk, lemon, vinegar, grape juice or any other acidic liquid, weakens the paper when applied. When you apply heat to it, the portion where you wrote your message oxidises and burns faster than the surrounding paper dry from the ink. The said portion will turn brown, thus revealing your secret message.

Oxidization is any chemical reaction that involves the moving of electrons. Specifically, it means the substance that gives away electrons is oxidized. When iron reacts with oxygen it forms a chemical called rust because it has been oxidized (The iron has lost some electrons.) and the oxygen has been reduced (The oxygen has gained some electrons).

Key Objectives

- To understand the basic process of oxidation
- To understand the result when iron and copper undergo oxidation
- To understand the result when fruits and vegetables undergo oxidation
- To understand how oxidation can be prevented

Materials

- Lemon (1/2 lemon per student)
- Bowl (1 per student)
- Spoon (1 per student)
- Water
- Paint brush (1 per student)
- White paper (1 piece per student)
- Light bulb (a small lamp works best)

Safety Instructions

Careful when holding the paper to the heat source such as a lamp.



Guiding Questions

1

What is oxidation?

2

What is the result when iron and copper undergo oxidation?

3

What is the result when fruits and vegetables undergo oxidation?

4

How can oxidation be prevented?

Intermediate

Resource Type

Project

Topics

Oxidation

Acidic liquids

Subjects

Chemistry

Keywords

Invisible Ink

Lemon Juice

Secret Message

Time For Activity

25 minutes

Making Invisible Ink

Tasks/Steps

- 1 Squeeze juice from the lemon into the bowl.
- 2 Add a few drops of water to the lemon juice.
- 3 Mix the water and lemon juice with the spoon.
- 4 Dip the bristles of the paint brush into the lemon juice/water mixture.
- 5 Write a message or draw an image onto the white paper.
- 6 Allow the paper to dry completely. The message or image should be completely invisible on the paper.
- 7 Hold the paper very close to the light bulb (lamb) - the paper should heat up from the light bulb. Adult supervision required.
- 8 Record observations and explain the 'magic' of what you see.

Authors/Source

→ <https://www.education.com/science-fair/article/invisible-ink-oxidation/>