

# Indigo Carmine – Teacher's Instructions

## Make Sure You Have...

Jar with ready made glucose/sodium hydroxide solution

Measuring cylinder

Indigo carmine solution

## What to Do....

1. Add a drop of the indigo carmine solution until a light green colour is produced.
2. Leave the jar to stand for a few minutes

**The solution should change colour from green to red to yellow**

3. Once the colour change has stopped (yellow), give the jar a good shake.

**A quick shake should turn the solution red and a longer shake should turn it green**

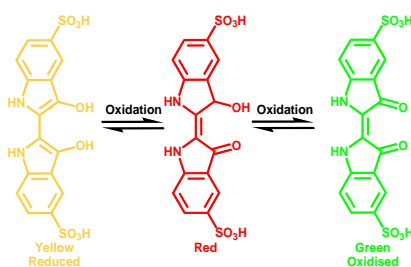
4. Leave the jar to stand for a few minutes

**You can keep repeating the sequence. Add a couple drops of the indigo carmine solution if the colour starts to fade**

5. Wash everything up (solutions can go down the sink)

## What's Happening?

What you have seen here is an example of **oxidation** and **reduction**. The indigo carmine is green when it has been oxidised and yellow when it has been reduced. It is red when it is half way between the two (semiquinone state).



*The indigo carmine molecule as it is oxidised*

Shaking the jar mixes the solution with oxygen, which oxidises the indigo carmine to the green form. Glucose in the solution reduces the indigo carmine and turns it back to the yellow form with the red appearing on the way. This is why when you leave the solution to stand it turns from green, to red then yellow. You can then make the reaction happen again by shaking the jar.

