The Transitioning Beaker Trick

Effect:

A glass container filled with clear, colourless liquid is briefly covered and suddenly it has been swapped for a flask full of opaque dark-blue liquid! It can then be changed back without anyone noticing the swap.

Description:

A conical flask (or beaker) is filled with clear liquids that resemble plain water. A cloth is placed over the flask or a piece of card is used to block it from the audience's sight. When this cloth or card is removed there will now be a different flask filled with an opaque dark-blue liquid. The cloth can be replaced and removed several more times and each time the flask will switch between the dark liquid one and the clear water one.

How it works:

The flask itself does not every change but the liquid inside it is undergoing an oscillating chemical reaction. Part of the time it is contains elemental iodine and part of the time the iodine is dissolved in the solution as ionic iodine. Mixed in with the solution is an iodine indicator, which is basically starch. In the presence of elemental iodine the starch turns dark blue. Once the iodine goes into solution as iconic iodine the starch indicator goes back to being colourless.

You will need to have someone carefully mix the following potion:

10 cm^3 1 mol dm^{-3} sulphuric acid

25 cm^3 0.1 mol dm^{-3} potassium iodide

5 cm^3 0.1 mol dm^{-3} hydrogen peroxide (take care it can irritate the skin!)

10 cm^3 0.005 mol dm^{-3} sodium thiosulphate

1 cm^3 starch solution

In the first, slow reaction, the tri-iodide ion is produced $.H^2O^2(aq) + 3\ I^-(aq) + 2\ H^+ \rightarrow I_3^- + 2\ H_2O$ (I_3^- reacts with starch to produce the blue colour)

In the second, fast reaction, tri-iodide is reconverted to iodide by the thiosulfate. $I_3^-\ (aq) + 2\ S_2O_3^{2-}(aq) \rightarrow 3\ I^-(aq) + S_4O_6^{2-}\ (aq)$ (I^- is colourless)

Hints and tips:

After a while the solution will start to change colour more often as the frequency of oscillations increases. This means you'll have less and less time to do the swap until eventually, the solution will just stay in its dark-blue state.

If you watch the solution closely, you will see that it starts to change colour slightly before the actual change. When you see the solution start to go cloudy, you know that the colour change is imminent. Be sure to practice this trick in the lab a few times so you can perfect your timing before trying it with an audience.