**Qualitative testing for biological molecules – proteins (Biuret test) STUDENT**

**Introduction**

A qualitative test just gives us a positive / negative result to tell us whether a particular substance is present. It does not tell us how much of the substance is present (or at what concentration). The Biuret test is simple in principle especially when the sample to be tested is a clear, colourless solution. If the sample itself is coloured and incompletely dissolved (e.g. mashed liver suspended in water) it can be difficult to see the colour change when the test solution is fully mixed with the sample. In such a case it is often possible to observe any colour change more clearly by layering the test solution on top of the sample and looking for colour change at the interface where the test solution touches the sample.

**Aim**

To test qualitatively for the presence of protein.

**Intended class time**

* Less than 30 minutes

**Chemicals**

|  |  |
| --- | --- |
| Biuret reagent | Corrosive  Causes severe burns  Danger of serious eye damage.  Dangerous for the environment. Very toxic to aquatic organisms.  Harmful if swallowed. Irritating to eyes and skin. |
| Protein suspension | No known hazard |

**Equipment**

* Distilled water
* Protein suspension
* 2 test tubes
* 5 cm3 syringe
* Pipette
* Biuret reagent

**Health & Safety**

* Eye protection must be worn throughout this activity.
* Biuret reagent contains sodium hydroxide and can cause serious eye damage. If the reagent splashes into the eyes flood the affected eye(s) with gently running tap water until a first aider arrives. The affected person must then be sent to hospital and eye irrigation must be continued during the journey.

**Procedure**

*Note: eye protection must be worn throughout this activity.*

1. Use the syringe to add 2 cm3 distilled water to one of the test tubes.
2. Using the pipette and holding the tube at a 45° angle, carefully allow a 1 cm3 of Biuret reagent to slide down the side of the tube so it forms a layer at the top of the sample.
3. Look for any colour change at the top of the solution, where the Biuret is sitting, and record your observations.
4. Shake carefully and gently to mix.
5. Observe and record the colour and appearance of the resulting solution.
6. Carefully set the tube aside.
7. Repeat the procedure using the protein suspension instead of the distilled water in a clean test tube.

**Extension questions**

1. What is the chemical composition of Biuret reagent and which of these chemicals are hazardous?
2. Why does the procedure include making observations with the Biuret as a layer on top of the sample before mixing?
3. What is the biochemical explanation for the positive result with the Biuret test?

**To submit**

For this piece of work to count towards Practical Activity Group 9 of the GCE Biology Practical Endorsement, you need to have evidence of your results from the Biuret tests as described above. You also need to have considered the above questions as the answers to these questions will aid you in preparation for your written examinations.