Clock Reaction DEMO

Labtech 20240730

Materials

- Stock **Solution 1:** 10g of **Sodium Sulphite** in 600mL water (1.67%).
- Stock **Solution 2:** 10g, 20g and /or 30g of **Potassium Iodate** in 500mL water to make at 2%, 4% and 6% of solution2a, 2b and 2c.
- 1% **Starch** – dissolve in warm water, keep in fridge
- **Lemon juice** (Woolis)
- Jar of **Neutraliser** – **Sodium Thiosulphate** crystals
- Large test tubes/ rack
- Plastic pipettes 1 mL, 3 mL

Safety

Concentrations used are not hazardous. Ensure to neutralise Iodine and rinse afterwards.

Method

1. Pour **5mL of Solution 1a** into the **Test tube1**
2. Add 0.6 mL of **Starch** - approx
3. Add 1.2mL of **Lemon Juice** - approx
4. Add **5mL of Solution 2a** into **Test tube2**.
5. **Mix** Test tube 1 and 2 and count time until the production of Iodine

*If needed, when ready, add a few of Neutraliser (Sodium Thiosulphate crystals) and stir well.

Rinse test tubes and repeat step1-5 at different con. Of Solution 2 b, 2c.

Iodine Clock. Technicians' notes

Materials

100mlBeakers x 5
Test tubes x 5 label A B C D E
Solution A x 20ml in each beaker
Starch 1% 2ml ' '
I.0 m Sulphuric Acid 10ml ' '
stopwatches

Test Tubes
A – H2O2 30ML
B – H2O2 20 ML + 10ML Dist water
C – H2O2 10ML +20ML Dist Water
D – H2O2 5ML +25ML Dist Water
E – H2O2 2.5ML + 27.5 ML Dist water

Solution A
6g Potassium iodide
7.5g Sodium Thiosulphate
In a litre of distilled water.

Method.
Students pour 20ml of solution A into each of the 5 beakers.
5 x Students to pour test tubes A-E simultaneously and start stopwatch to time reaction

Iodine Clock Reaction:

Posted on 20/08/2016 by **labnetwestaccount**

Introduction:
This demo shows a chemical reaction which can be used to show how concentration affects reaction rates.
Students will observe and describe chemical and physical change.
OBJECTIVE
Differentiate between common chemical and physical changes.
Analyse factors that influence chemical and physical change.
INTENDED LEARNING OUTCOMES
1. Make observations and measurements
2. Collect and record data using procedures designed to minimise error.
3. Analyse data and draw warranted inferences.
Solutions
Chemical A:
400 mL. distilled Water
1.6 gm of KIO3
Chemical B:
320 mL. distilled Water
1.6 gm powdered starch: add a little water and make into paste
1 gm Na2S2O5-Sodium Metabisulfite
2 mL. concentrated sulfuric Acid
Add starch to 320 ml boiling water, boil for 2 more minutes. When solution is cool to touch,

add Sodium metabisulfite and sulfuric acid. Add an additional 500 mL. of distilled water to the solution.

Procedures

1. Pour 50 mL of Chemical A into a 250 ml flask.
2. Pour 50 mL of Chemical B into the same flask.
3. Time how long it takes for the reaction to be completed, mark it on a graph on the board.
4. Mix 40 mL of chemical A with 10 mL of distilled water and 50 mL of chemical B, time the reaction and mark it on a graph on the board.
5. Mix 30 mL of chemical A with 20 mL of distilled water and 50 mL of chemical B, time the reaction and mark it on a graph on the board.
6. Mix 20 mL of chemical A with 30 mL of distilled water and 50 mL of chemical B, time the reaction and mark it on a graph on the board.
7. Mix 10 mL of chemical A with 40 mL of distilled water and 50 mL of chemical B, time the reaction and mark it on a graph on the board.

Safety concerns:

Teachers and students: be sure to keep all Chemical and Fire Safety Rules that are specified by your teacher and in all general laboratory experiences. Wear an apron to keep the chemicals off your clothing.

Analysis

1. What happened to the reaction rate as you diluted solution A?
2. Why do you think the reaction change speed?
3. Predict what would happen if we increased the concentration of solution A? Defend your answer.

NOTES AND VARIATIONS:

This comes from the teachers' guide of the old Chemistry Experimental Foundations course. Works every time and always has the "wow" factor!

An interesting variation on this, used with good success in lower school and even upper primary students as extension is to heat the test tubes with solutions A and B in the microwave for the temperature experiment before adding them together.

Trying to use a beaker of warm or hot water to heat the two test tubes is slow and messy. You can get a great set of results by heating the test tubes (standing in a 250mL beaker) in the microwave for 3, 6, 9, 12, 15 seconds etc and it is quick and the results are good.

Note the upper limit on useful temperature is about 60 degrees C.

PREVIOUS ARTICLE
Indicators-making your own:

NEXT ARTICLE
Ions-detection: