UNIVERSITY OF WESTMINSTER

Control of Substances Hazardous to Health (COSHH)

Title of Experiment	**Room/Laboratory**
1. Iodine Clock Reaction Practical	

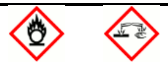
Brief description of work

This class practical involves students combining the four reagents supplied (3% hydrogen peroxide, 1% potassium iodide, starch water and 50 mM ascorbic acid) using micropipetes with disposable plastic tips to achieve a controlled delay in the appearance of the blue-black colour characteristic of the starch-tri-iodide complex.

Does this work involve genetic modification or genetically modified organisms? No
If you have answered "Yes" to this question you must also complete a risk assessment for genetic modification and submit it to the GMSC (https://docs.google.com/a/my.westminster.ac.uk/viewer?a=v&pid=sites&srcid=bXkud2VzdG1pbnN0ZXIuYWMudWt8dW93LWZzdC1oZWF0aC1zYWZldHktYW5kLXdlbGxiZWluZ3xneDo2MmU5YTAyOGZlZmMwMTBm)

Note that a COSHH assessment for class activity may not be of a sufficiently high level to cover technician preparation; double assessment usually required. Note also that it is RISK that is to be assessed, not HAZARD.

2. LIST OF SUBSTANCES USED OR CREATED (continue on a separate sheet if necessary)
1). Manufacturers Safety Data 2). Computer Data Base 3). Product Label 4). Other [Specify]

CODE	NAME	PHYSICAL DESCRIPTION at each stage at which it is used (e.g. clear solution, powder, blue crystals)	DATA AVAILABLE (TICK BOX[ES]) 1	2	3	4	HAZARD CLASSIFICATION (include all that are appropriate)	What severity of harm might occur and what is the minimum quantity or concentration that could be expected to cause harm (e.g. Workplace Exposure Limits, see HSE document EH40).	How might exposure of humans or the environment to the substance occur and what is the maximum quantity or concentration would be involved. Include multiple possibilities as appropriate (for example preparation of a solution and its use).	How probable is exposure to a quantity and/or concentration that might cause harm? (please consider the frequency of potential exposure).	Based upon the information provided, what risk level does use of this substance present to humans and/or the environment?
A	**3% (w/w) Hydrogen Peroxide**	**Clear, colourless solution**	✓					10% (w/w) for severe harm	Splashes or spilling	Exposure is quite probable but 3% (w/w) is unlikely to cause more than irritation. Technicians are at greater risk if they prepare this from a more concentrated solution.	Low Medium
B	**1% Potassium Iodide**	**Clear, colourless solution** **White crystals before it is dissolved**	✓					Possible irritation	Splashes or spilling	Exposure is quite probable but is unlikely to cause more than minor irritation.	Low

C	**Starch Water**	**Slightly cloudy solution**	✓					None	Splashes or spilling	NA	Low
D	**50 mM Ascorbic Acid**	**Clear, colourless solution** **White crystals before it is dissolved**	✓					Possible irritation	Splashes or spilling	Exposure is quite probable but is unlikely to cause more than minor irritation.	Low

NOTE: 1) EXPLOSIVE  2) FLAMMABLE  3) OXIDISING  4) CORROSIVE  5) ACUTE TOXICITY  6) SERIOUS HEALTH HAZARD  7) GAS UNDER PRESSURE  8) HAZARDOUS TO THE ENVIRONMENT  9) RADIATION 10) OTHER (specify).

3. LIST OF MICROORGANISMS OR CELL LINES TO BE USED

NAME OF MICROORGANISM OR CELL LINE	ACDP Group	Type and volume of culture	If ACDP Group 2, how does infection occur? (e.g. inhalation of aerosol)	How might exposure to the infectious agent occur **Include multiple possibilities as appropriate (for example starting a culture subsequent manipulations).**
NA				

4. DO ANY OTHER ASPECTS OF THE WORK PRESENT RISKS TO HUMANS AND/OR THE ENVIRONMENT (INCLUDE PHYSICAL DANGERS SUCH AS SHARPS OR ELECTRICAL SOURCES) AND POTENTIALLY HAZARDOUS BIOLOGICAL MATERIALS NOT INCLUDED IN SECTION 2 (*E.G.* UNSCREENED HUMAN BLOOD SAMPLES)?

What is the hazard?	HOW MIGHT THIS HAZARD CAUSE HARM TO HUMANS AND/OR THE ENVIRONMENT	How severe are the potential consequences?	How probable is harm to humans and/or the environment?	Risk rating. H/M/L
Sharps from broken glass pipettes.	The main cause for concern is if a pipette breaks while it is being pushed into a pipette filler.	Severe laceration and bleeding requiring hospital treatment.	Low	M

5. DETAIL THE CONTROL MEASURES TO BE ADOPTED FOR ANY RISK THAT HAS BEEN EVALUATED AS MEDIUM OR HIGH, or ANY ACDP GROUP 2 MICROORGANISM OR CELL LINE TO BE USED (*NB*. See hierarchy of control in COSHH Guidance).

Do any aspects of the work to be undertaken present particular risks to expectant or new mothers? No
If you have answered "Yes" please detail these in the table below and state either that expectant and/or new mothers should not undertake this work *or* specify what additional precautions should be taken (*e.g.* particular stages that should be completed by other people).

NAME OF SUBSTANCE, HAZARD or MICROORGANISM or CELL LINE	Nature of the Harm and who or what might be affected?	Initial Risk Rating:	CONTROL MEASURES TO BE REDUCE THE POTENTIAL HARM OR PROBABILITY OF HARM (See Guidance regarding hierarchy of control).	WHAT IS THE POTENTIAL SEVERITY OF HARM GIVEN THESE CONTROL MEASURES?	WHAT IS THE PROBABILITY OF HARM GIVEN THESE CONTROL MEASURES?	WHAT IS THE RESIDUAL RISK FACTOR?
Sharps from broken glass pipettes.	Students	M	Students will be told how to do this safely (ensuring that the pipette is held close to the pipette filler during this activity) during the safety briefing. Demonstrators will also be instructed to be vigilant for students carrying this activity out unsafely during the practical.	M/H	L	L

Exposure to hydrogen peroxide of concentration > 10% (w/w) while	Technicians	M	Wearing gloves and safety glasses while working with hydrogen peroxide solutions of >10% (w/w). *Or* Purchasing 3% (w/w) hydrogen peroxide	L	L	L

6. **PERSONNEL INVOLVED WITH SUBSTANCES (continue on a separate sheet if necessary)**

SURNAME/CLASS	INITIALS	STATUS	INVOLVEMENT - FREQUENCY OF USE r (DAILY/WEEKLY/MONTHLY/OCCASIONALLY)
Academic Staff Supervising the Practical			OCCASIONALLY
Postgraduate Demonstrators			OCCASIONALLY
Undergraduate Students doing the practical			OCCASIONALLY
Technical Staff			OCCASIONALLY

7. **EMERGENCY PROCEDURES** (as per Hazard Data Sheet).
if any of the substances, biological materials or procedures identified above is likely to pose a special hazard in an emergency, then identify below action to be taken.

SUBSTANCE, HAZARD or MICROORGANISM or CELL LINE	SPILLAGE/ UNCONTROLLED RELEASE	FIRE	FIRST AID (Note: Consider inhalation, ingestion, exposure to skin and to the eyes).
NA			

8. **Detail how all substances and biological material will be stored and disposed of**

STORAGE - SAFETY CONSIDERATIONS	DISPOSAL PROCEDURES DURING AND AT END OF EXPERIMENT
3% (w/w) Hydrogen Peroxide- None	At this concentration the reagent can be washed down a sink with copious water
1% Potassium Iodide- None	At this concentration the reagent can be washed down a sink with copious water
Starch Water- None	The reagent can be washed down a sink.
50 mM Ascorbic Acid- None	At this concentration the reagent can be washed down a sink with copious water

9. **REVIEW AND MONITORING OF CONTROL MEASURES**
(Required checks, and their frequency, on the adequacy and maintenance of the control measures during the course of the experiment)
(NB. Biosciences Safety Code in respect of **health surveillance** requirements. **If health surveillance is required completion of this form is not in itself sufficient. Provisions for health surveillance must also be implemented and documented**).

10. **OTHER RELEVANT INFORMATION** (continue on a separate sheet if necessary)

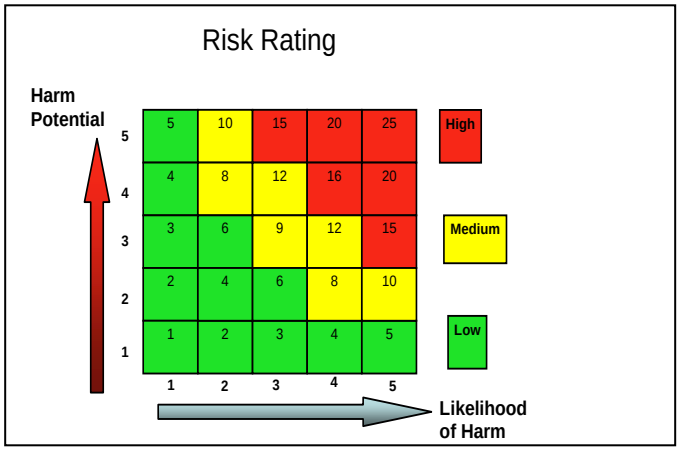
(e.g. restriction of usage; transportation risks; labelling requirements; assessment review date, etc.)

11. I certify that, to the best of my knowledge, the above precautions will adequately control the risks from the hazardous substances listed. I have brought the assessment to the notice of the relevant technicians.

Name of Assessor: Dr Stuart Thompson Signed:

Status of Assessor: Senior Lecturer Date: 10th January 2024

1. **Persons at Risk:** E = Employees; C = Contractors; V = Visitors; Mp = Members of the public; S = Students; EM = Expectant Mothers; DP = Disabled persons. The types and numbers of person at risk may impact the degree and likelihood of the risk.
2. **Existing Controls:** Considerations could include:- guarding; training; safe systems of work; segregation; safety equipment; examination and testing; emergency arrangements.
3. **Risk Classification:** In considering the likelihood of an injury or incident occurring the following potential contributory factors should be considered:-
   - How frequent the work is carried out? A higher frequency may increase the risk.
   - Whether those carrying out the work are more at risk e.g. a disabled person, an expectant mother, or someone with little experience.
   - Are suitable tools and equipment available that are properly maintained?
   - Has a safe system of work been established and implemented?
   - Has suitable information, instruction and training been provided?
   - Is there adequate supervision?
   - Are the controls in place adequate or are additional controls required?



Likelihood of occurrence	Potential Severity of injury of financial loss
1. **Improbable**	1. **None**
2. **Remote**	2. **Negligible**
3. **Possible**	3. **Minor**
4. **Probable**	4. **Major**
5. **Certainty**	5. **Fatal**

Risk = Likelihood X Severity

Using the values above determine the risk classification by multiplying the likelihood and the potential severity you consider appropriate and enter the result in the matrix above to obtain the risk rating: e.g. If you consider the potential harm to be major (4) and the likelihood to be remote (2) the risk classification is 4 x 2 = 8 which is classed as a “Medium” risk using the matrix.