

Job Hazard Analysis – Elephant’s Toothpaste				
Job Location: 318 GWH		Laboratory Group: N/A		Date: 07.01.17
Activity or Job	Perform the Elephant’s Toothpaste Demonstration			
Completed By	Samuella Sigmann			
Equipment and Chemicals Required	<p>Chemicals: 30% hydrogen peroxide (H₂O₂) CAS 7722-84-1; potassium iodide (KI) CAS 7681-11-0; Joy dish soap; food color (Optional)</p> <p>Equipment: 1 L graduated cylinder; spill tray, various beakers, scoopula,</p> <p>Emergency Equipment: Fire extinguisher, eyewash/shower unit, spill kit, small broom & dustpan</p> <p>PPE Required: Standard lab dress and slip resistant shoes, chemical splash goggles, nitrile gloves, lab coat or apron</p> <p>Engineering Controls: safety shield, chemical fume hood (optional)</p>			
Step	Work Steps and Tasks	Hazards Identified for each Task / Step	Risk Level (exposure x probability x consequence) 1 – 10 scale	Control / Safe Work Procedures for each Task / Step
1	Obtain 30% hydrogen peroxide (H ₂ O ₂) from storage and take to hood if available		Low (3)	<ul style="list-style-type: none"> Worker will don chemical splash goggles and nitrile gloves; lab coat or disposable apron. 30% H₂O₂ is very reactive Read SDS or literature for chemical hazards and ensure they are understood Wear all PPE as above Note location of and visually inspect spill kit w/ inert (nonorganic) neutralizing material Review laboratory spill response and ER procedures Use situational awareness while transporting to hood
2	Obtain potassium iodide (KI) from storage			<ul style="list-style-type: none"> Use situational awareness while transporting to work area If spilled, avoid inhalation of dust – collect with small broom and dustpan and dissolve in water
3	Add ~150 mL of 30% H ₂ O ₂ to the cylinder	<p>Eye and dermal contact (corrosive)</p> <p>Respiratory irritant</p> <p>Chemical splash</p> <p>Spill</p> <p>Broken glass</p>	Moderate (4)	<ul style="list-style-type: none"> Avoid inhalation. Do not allow in drains. For small spill, dilute with water liberally prior to absorption with wet paper towels or absorbent pads. Rinse all materials thoroughly prior to placing in the trash can. Broom & dustpan for glass Work on spill tray Pour H₂O₂ in chemical fume hood if available
4	Add ~25 mL of dish soap and swirl cylinder to mix	Same as Step 1	Very low (0.5)	<ul style="list-style-type: none"> PPE from Step 1 Broom & dustpan for glass Work on spill tray
5	Add 4 drops of food color of choice at 4 points around the cylinder opening	Same as Step 1	Very low (0.5)	<ul style="list-style-type: none"> Same as Step 2

6	All at once add a small scoop of solid KI and swirl the cylinder slightly	Chemical splash – corrosive; eye damage; inhalation (KI dust) Chemical spill Flammability	Low (3)	<ul style="list-style-type: none"> • Place cylinder on Reaction mixture will generate high temperature so do not let anyone handle the flask or play with the foam. • Place spill tray behind safety shield • Small amounts of solid KI can be swept up and dissolved in water and flushed down the drain (check with your EHS office) • Stay back 10 feet • Oxygen gas is generated – keep open flames away. (Include ignition of gas in the risk assessment if the nature of the gas will be included in the procedure) • Review fire extinguisher use
7	Clean up foam	Dermal contact Thermal burn Slip hazard	Very low (1)	<ul style="list-style-type: none"> • Allow reaction foam to cool and ensure reaction has stopped before cleaning • Use caution if the solution gets on the floor as mixture is slick. • No known hazardous waste generated; sudsy foam solution can be rinsed down the sink • Wear non-slip shoes
Hazards Checklist:				
	Can someone be exposed to chemicals? Yes	If so, what is the nature of the chemical hazard? 30% hydrogen peroxide is a strong oxidizer. The concentrated form can cause blistering and discoloration of skin. Inhalation can cause respiratory edema. KI is a respiratory irritant and SDS Reviewed? <input checked="" type="checkbox"/> Yes		
	Can someone slip, trip or fall? Possible	Can someone injure someone else? Not likely		
	Can someone be caught in anything? Not likely	Can someone strike against or make contact with any physical hazards? Contact with oxidizing liquid Flammable gas is generated and could flash in a poorly ventilated room where fuel vapor of dusts are present		
	Laboratory Supervisor or PI Comments – NEVER absorb concentrated hydrogen peroxide with organic material such as sawdust. ⁱ Avoid all organic materials.			
	Laboratory Supervisor or PI Signature		Date	
	Employees Signature		Date	

ⁱ Clark, D. E. 2001. "Peroxides and Peroxide-Forming Compounds." *Journal of Chemical Health and Safety*. 8(5): 12-21. ([CAMEO Chemicals](#))