

AUSTRALIAN SCHOOL SCIENCE INFORMATION SUPPORT FOR TEACHERS AND TECHNICIANS

Published on ASS/ST (https://assist.asta.edu.au)

Home > Lightning in a test tube

Lightning in a test tube

Posted by Anonymous on Thu, 2015-08-20 15:08

Lightning in a test tube: I have a teacher who is planning on performing the 'lightning in a test tube' demonstration in the school lecture theatre. The experiment involves layering ethanol on top of sulfuric acid in a test tube and then dropping some potassium permanganate crystals into the sulfuric acid. I would prefer it to be performed in a fume cupboard.

Voting:

☆☆☆☆☆ No votes yet

Year Level: 7 8 9

10 Senior Secondary Laboratory Technicians: Laboratory Technicians

Showing 1-1 of 1 Responses

Lightning in a test tube

Submitted by on 25 August 2015

Answer reviewed 23 February 2023

Science ASSIST strongly advises against this demonstration being performed in a school. The risks are too high and the demonstration is not able to be adequately controlled.

Each of the chemicals involved in this activity has its own particular significant hazards.

- Ethanol: flammable liquid
- Sulfuric acid: corrosive acid
- Potassium permanganate: oxidising agent

Sulfuric acid reacts with potassium permanganate to form manganese (VII) oxide (Mn2O7) [also called manganese heptoxide], which is explosive and reacts violently with the ethanol. Significant risks of explosion or fires or both are foreseeable and cannot be controlled, so the risk assessment would conclude that the risks of the demonstration are significant and cannot be adequately controlled and therefore should not be conducted.

Alternative demonstration

An alternative method for demonstrating this reaction in a **controlled** way on a **small scale** can be found on the Royal Society of Chemistry Education in Chemistry website: <u>'Balls of fire'</u>.1

Planning science activities

A risk assessment should be conducted for each practical activity, taking into consideration aspects including staff training, student skills and behaviour, staff/student allergies, school facilities and whether it is permitted in your jurisdiction.

The Queensland Department of Education has produced a safety alert on the topic of unpredictable experiments: see <u>https://education.qld.gov.au/</u> and search for 'Unpredictable science experiments'² and guidance material for planning science experiments, investigations and activities.3

References

1 Royal Society of Chemistry (2014) '*Balls of fire*'. Retrieved from the Royal Society of Chemistry Education in Chemistry website: <u>https://edu.rsc.org/exhibition-chemistry/balls-of-fire/2000040.article</u>

2 Queensland Department of Education, (2014) *Safety Alert: Unpredictable experiments*. Retrieved from the Queensland Department of Education website: <u>https://education.qld.gov.au/</u> and search for 'Unpredictable science experiments'.

3 Queensland Department of Education, (2021, October 28). *Science experiments, investigations and activities*. Retrieved from the Queensland Department of Education website: https://education.qld.gov.au/curriculum/stages-of-schooling/CARA/activit...

Source URL:https://assist.asta.edu.au/question/3109/lightning-test-tube