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Posted by Anonymous on Fri, 2015-02-13 15:17

Sulfur hexafluoride: I require information on availability, safety, cost and suppliers of sulfur hexafluoride. I would also appreciate advice from anyone with experience in using and disposal of the gas. Thank you.

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Laboratory Technicians

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Sulfur Hexafluoride

Submitted by sat on 26 February 2015

Sulfur hexafluoride (SF₆) is a colourless, odourless gas which is produced from the reaction of sulfur with fluorine gas. It is a very unreactive gas which has a density about five times greater than that of air.

Sulfur hexafluoride has a very low toxicity but, as with other gases, it poses an asphyxiation hazard as it can displace air. Its high density means that it will accumulate in low-lying areas and therefore, good ventilation must be ensured in an area where the gas has been released.

When inhaled, sulfur hexafluoride has the effect of lowering the timbre of the voice, the opposite effect of a gas of low density, such as helium. Inhaling sulfur hexafluoride is very dangerous as the high density of the gas makes it difficult to expel from the lungs. Therefore, there is a significant risk of death by asphyxiation in carrying out this activity. Inhaling any inert gas can have serious health consequences and can potentially lead to asphyxiation; please see the references below for more information about the dangers of inhaling industrial gases.

Sulfur hexafluoride is a potent greenhouse gas, which does not break down in the atmosphere, and has a very high global warming potential 23,900 times that of carbon dioxide. Due to its low reactivity, the only way to dispose of sulfur hexafluoride is to release it to the atmosphere. As it is a greenhouse gas, the importation of sulfur hexafluoride is subject to licensing and handling requirements and its cost is quite high—probably prohibitive for most schools.

<p>Taking into consideration the asphyxiation hazard of using sulfur hexafluoride, as well as the environmental concerns, Science ASSIST does not endorse the use of sulfur hexafluoride in schools and recommends that schools do not carry out any activities, experiments or demonstrations using sulfur hexafluoride.</p>

Substitution of a safer alternative

To demonstrate a gas with a greater density than air, the less hazardous and cheaper alternative to sulfur hexafluoride is carbon dioxide, which has a density 1.6 times that of air.

This property of carbon dioxide can be demonstrated by floating bubbles on a bed of the gas or by 'pouring' the gas from a jug or bucket into a vessel which contains lighted candles of different heights.

Dry ice also has associated cryogenic and asphyxiation hazards; please see the Science ASSIST Standard Operating Procedure '[SOP: Handling dry ice](#)' for more information.

Another alternative is to show a *YouTube* video that demonstrates the properties of sulfur hexafluoride. For example, <https://youtu.be/DzLX96VWTkc> demonstrates the buoyancy of the gas. (Note: We advise against promoting videos that encourage the extremely hazardous practice of inhaling this gas.)

References

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Further information on the dangers of inhaling helium, sulfur hexafluoride and other industrial gases

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