

Azidotrimethylsilane

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We report a serious incident in which a 1-gal bottle of azidotrimethylsilane (Aldrich product number 15,507-1) was broken in a confined area. Upon reading our Material Safety Data Sheet (MSDS) for this chemical, which indicated that it is a flammable liquid with toxic properties by route of inhalation, a worker proceeded to place Hazorb on the spill to contain it. The employee wore a supplied breathing air cap along with gloves and boots. He completed his task in less than two minutes. Two supervisors were standing about 20 feet from the entrance of the confined area where the spill had taken place.

As the worker who responded to the incident was exiting the area, he reported to the supervisors that he felt somewhat lightheaded. One supervisor also almost immediately felt lightheaded and had to be helped to an outer office. An occupational nurse and physician were called and began treating the employees with oxygen. The blood pressure of the supervisor dropped precipitously. The blood pressure of the employee who responded to the spill was slightly elevated.

In a rather short period of time, other employees who had been in the same area reported tightness in the chest and lightheadedness. In addition, quite a number of these employees had extremely bloodshot eyes. In all, 24 employees were sent to the hospital for observation and released within four hours, except for the individual whose blood pressure had dropped. It was later discovered that he was taking medication to control high blood pressure. He was released the next day and has not experienced any further symptoms.

Several issues are important for those who use silyl azides. The silicon-nitrogen bond is readily hydrolyzed, producing hydrazoic acid. Inhalation or absorption of silyl azides allows hydrazoic acid to be released into the body. Hydrazoic acid is a potent vasodilator. Individuals who are taking blood pressure medications need to be warned of the potential danger (an apparent synergistic effect) if silyl azides or any source of hydrazoic acid is present in the workplace. One study reports that laboratory personnel experienced headaches at vapor concentrations as low as 0.5 ppm [Am. Ind. Hyg. Assoc. J., 31, 318 (1970)]. After inhaling hydrazoic acid vapor, the acute effects noted in humans are ocular irritation, bronchitis, headache, hypotension, weakness, and collapse.

We reviewed the MSDS for azidotrimethylsilane from three other sources and none of them mentioned this health effect except to say "toxic by inhalation" and "target organ: nerves, heart." This needs to be made clearer. Aldrich has changed the word "heart" to "cardiovascular" for our label precautions and added the following paragraph to our MSDS:

"Individuals who are using medication to control their blood pressure should not work with or come in contact with azidotrimethylsilane. This material can release hydrazoic acid, which is known to cause a drop in blood pressure. Exposure to this material has caused some individuals to have bloodshot eyes. Any individual who is exposed to this material should be removed to fresh air and seek medical attention immediately."

We are also sending this information to our customers in an effort to communicate this potential hazard. We hope that your readers will also take note of this potential hazard.

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