

Sodium Azide (NaN_3)

Sodium azide (NaN_3) is a white odorless solid that is highly water soluble and transitions to a toxic gas, hydrazoic acid, when coming into contact with water or solid metals (lead, brass, copper, silver, mercury). The gaseous form may exhibit a pungent smell but often is not strong enough to warn people of danger. Inhalation and ingestion are both harmful, with inhalation typically posing the greatest harm. When sodium azide is swallowed and reacts with gaseous contents, hydrazoic acid is formed and may be expelled via vomiting which poses a significant secondhand inhalation hazard. Of note, hydrazoic acid is lighter than air and quickly rises when in open spaces, resulting in a significantly higher exposure risk in closed spaces. Similar to cyanide, sodium azide inhibits cytochrome C oxidase, the final enzyme in the mitochondrial electron transport chain, ultimately disrupting oxidative phosphorylation. This inhibition leads to a rapid decrease in ATP production and impairs cellular energy metabolism. The decrease in ATP also results in acidosis due to the shift to anaerobic metabolism and lactic acid buildup. Additionally, sodium azide is metabolized into nitric oxide which acts as a potent vasodilator.

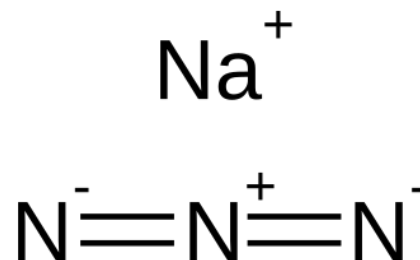
Sodium azide is a mutagen and must be handled with extreme caution. Acute effects following exposure to sodium azide may include nausea/vomiting, cough, ocular irritation, burning or blistering of the skin, hypotension, and/or dizziness. More severe exposures may cause muscle weakness or pulmonary edema. No specific antidote exists and treatment should focus primarily on supportive care.

Following exposure, the following precautions should be taken if applicable:

- Flush eyes with cool water for 15 minutes, remove contact lenses if present
- Remove contaminated clothing (place in double layered plastic bag and coordinate disposal with Health Department) and wash skin with soap and water
- Items with potential of containing sodium azide should not be placed down drains as they may explode following contact with the pipe
- Vacate area where gas was released, stay low to the ground as toxic gas will rise
- Do not induce vomiting
- Refrain from rescue breathing and focus on chest compressions only

For individuals working closely with sodium azide, rubber gloves should be worn to prevent contact with skin, contact lenses should be avoided, non-vented goggles should be worn to prevent ocular exposure, and NIOSH approved respirators should be available. Sodium azide is not flammable but decompresses explosively when heated. Dry sand should be used as an extinguishing agent; water should not be directly sprayed on the compound as this will result in the formation of hydrazoic acid. In the event of a spill, residues should not be disposed of in metal pipes and should be labeled as HAZARDOUS WASTE.

For more information or questions about sodium azide, please call your local poison center at 1-800 222-1222.



Sodium Azide

Did you know?

Sodium azide has various everyday uses!

It is used in airbags to facilitate rapid deployment. During a collision, an electrical signal triggers the explosion of sodium azide, producing hydrazoic acid (HN_3), which rapidly inflates the airbag.

Sodium azide is also used as a biochemical preservative due to its bacteriostatic properties and in pest control efforts.

References

1. Right to Know Hazardous Substance Fact Sheet: Sodium Azide. New Jersey Department of Health. 2008. Accessed June 10, 2026. <https://www.nj.gov/health/eoh/rtkweb/documents/fs/1684.pdf>.
2. Sodium Azide. Centers for Disease Control and Prevention. 2026. Accessed June 10, 2026. <https://www.cdc.gov/chemical-emergencies/chemical-fact-sheets/sodium-azide.html>.
3. Sodium Azide: Uses, Safety and Sustainable Alternatives. Abcam. 2026. Accessed June 10, 2026. <https://www.abcam.com/en-us/>

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