

## Sodium Azide ( $\text{NaN}_3$ )

Sodium azide ( $\text{NaN}_3$ ) is a white, odorless, solid that is highly water soluble and transitions to a toxic gas, hydrazoic acid, when in 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. Dermal absorption, ingestion and inhalation exposures can all result in toxicity, with inhalation typically posing the greatest harm. When ingested, the toxic gas may be expelled via emesis becoming a secondhand inhalation hazard. Of note, hydrazoic acid is lighter than air and quickly rises when in open spaces, resulting in high-risk exposures in enclosed spaces. 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.

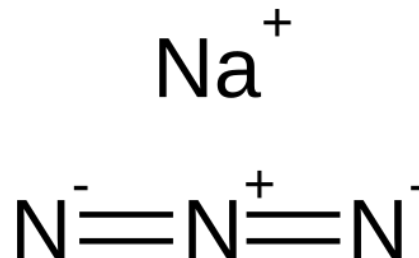
Like cyanide, sodium azide inhibits cytochrome C oxidase, the final enzyme in the mitochondrial electron transport chain, ultimately disrupting oxidative phosphorylation, decreasing ATP production and impairing cellular energy metabolism. This decrease in ATP results in the shift to anaerobic metabolism, lactic acid buildup and acidosis. Additionally, sodium azide is metabolized into nitric oxide which acts as a potent vasodilator. As a result, severe exposures may result in muscle weakness, pulmonary edema, metabolic acidosis, mixed shock states and cardiovascular collapse. No specific antidote exists and treatment should focus primarily on supportive care.

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

- Vacate area where gas was released, stay low to the ground as toxic gas will rise
- 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
- Do not induce vomiting
- In case of cardiopulmonary resuscitation, refrain from rescue breathing; focus on chest compressions only

Individuals who work close with sodium azide, should wear proper personal protective equipment (PPE) including gloves, non-vented goggles, and NIOSH approved respirators. Though sodium azide is inflammable, it decompresses explosively when heated. Dry sand should be used as an extinguishing agent; water should not be utilized due to toxic gas formation. 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 or any exposure, 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 ( $\text{HN}_3$ ), 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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