

Aromatic ammonia inhalants

The Maryland Poison Center received a call from the health suite at a local high school about a sixteen-year-old male student. Thirty minutes ago he took one sniff from a product called "Atomic Rhino Smelling Salts." He obtained it from another student and used it because he was curious to see what would happen. He has no physical complaints; he is afraid that he will get into trouble. His blood pressure is a little elevated and his eyes are red.

What are Atomic Rhino Smelling Salts?

Atomic Rhino Smelling Salts is the brand name of an "aromatic ammonia inhalant." Ammonia inhalants have been around for centuries. They are used to revive someone who has fainted so are sometimes taped to the wall next to the blood drawing station in your local laboratory or phlebotomy department. They are usually a combination of liquid ammonia and a perfume. Ammonia is a strong respiratory irritant, and when brought near the nose (usually four to six inches or ten to fifteen centimeters) it causes the victim to instantly inhale and breathe faster, which also increases the heart rate and thus blood flow to the brain.

Recently, smelling salts have been used to enhance athletic performance, especially in activities that require maximum effort for a short time, like powerlifting and football. Data are mixed and in most controlled trials, there is no benefit for athletic performance. In 2018, one study suggested that there is a positive correlation between the use of an ammonia inhalant prior to the performance of a maximal isometric midhigh pull test (*J Strength Cond Res.* 2018;32(1):244-7). A more recent study showed increased perception of performance, but no change in strength, power, or muscular drive (*Eur J Sport Sci.* 2021 Aug 1). Ammonia inhalants are being used during timeouts by the players in professional football games. As the use of these products increases at the professional level, there is concern that it will be noticed by those watching, particularly young players, and the use at the college, high school, and younger levels of competition may increase.

What are the risks of using ammonia inhalants?

People with asthma should avoid using ammonia inhalants because inhalation may trigger an asthma attack. Holding it closer to the nose and for a longer period is very irritating, and quite unpleasant, but those sensations are transient, usually resolving rapidly. It is unknown if there are consequences from overuse, either short-term or long-term. The salts typically release between 50 and 100 parts per million (ppm) ammonia (threshold for smelling ammonia in air is 5 ppm). The National Institute for Occupational Safety and Health (NIOSH) cites a concentration of 300 ppm for 30 minutes as immediately dangerous to life or health (IDLH) (<https://www.cdc.gov/niosh/idlh/7664417.html>). This concentration is much higher and exposure are likely for a longer duration than use of smelling salts for athletic performance.

Call your regional poison center at 1-800-222-1222 with any ammonia exposures for patient-tailored recommendations for ammonia inhalation.



Did you know?

Ammonia is a common ingredient in cleaning products.

Most household products contain less than 3% ammonia. They should be used in well-ventilated areas because prolonged exposure can be irritating to the respiratory tracts. Spills of large volumes of 3% ammonia can produce concentrations of 550 ppm at a height of 5 feet above the spill. Mixture of ammonia with hypochlorite containing products (bleach), produces chloramine gas, which is a potent pulmonary irritant that may require treatment in a hospital. If someone accidentally spills 3% ammonia or produces chloramine gas, the first thing to do is seek fresh air and evacuate others from the immediate area. Opening windows and turning on an exhaust fan will also help remove ammonia from the air.

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