

WASC 2009

Commentary from
Wikipedia on
Saltpetre

10-11-2008

This is Google's cache of http://en.wikipedia.org/wiki/Potassium_nitrate. It is a snapshot of the page as it appeared on 10 Nov 2008 22:27:35 GMT. The current page could have changed in the meantime. [Learn more](#)

These search terms are highlighted: **saltpetre wikipedia**

[Text-only version](#)

Potassium nitrate

From **Wikipedia**, the free encyclopedia

Potassium nitrate is a chemical compound with the chemical formula KNO_3 . A naturally occurring mineral source of nitrogen, KNO_3 constitutes a critical oxidizing component of black powder/gunpowder. In the past it was also used for several kinds of burning fuses, including slow matches. Because potassium nitrate readily precipitates, urine was a significant source, through various malodorous means, from the Late Middle Ages and Early Modern era through the 19th century.

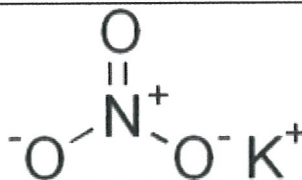


Its common names include **saltpetre**, from Medieval Latin *sal petrae*: "stone salt" or possibly "Salt of Petra" (**saltpeter** in US English), **nitrate of potash**, and **nitre** (US **niter**). For specific information about the naturally occurring mineral, see **nitre**. The name **Chile saltpeter** is applied to sodium nitrate, a different nitrogen compound that is also used in explosives and fertilizers.

Contents

- 1 Description
- 2 History of production
- 3 Applications
- 4 See also
- 5 References
- 6 Literature
- 7 External links

Description

Potassium nitrate is the oxidizing component of black powder. Before the large-scale industrial fixation of nitrogen through the Haber process, major sources of potassium nitrate were the deposits crystallizing from cave walls and the draining of decomposing organic material. Dung-heaps were a particularly common source: ammonia from the decomposition of urea and other nitrogenous materials would undergo bacterial oxidation

Potassium nitrate	
	
	
Other names	Nitrate of potash, Vesta Powder, or Saltpeter
Identifiers	
CAS number	[7757-79-1]
ChemSpider ID	22843
Properties	
Molecular formula	KNO_3
Molar mass	101.1032
Appearance	white solid
Density	2.109 g·cm ⁻³ (16 °C) (solid ^[1])
Melting point	334 °C ^[1]
Boiling point	400 °C <i>decomp.</i> ^[1]
Solubility in water	36 g/100 mL (25 °C)
Hazards	
MSDS	External MSDS
EU classification	O ^[1]
	

to produce nitrate. It was and is also used as a component in some fertilizers. When used by itself as a fertilizer, it has an NPK rating of 13-0-38 (indicating 13.9%, 0%, and 38.7% of nitrogen, phosphorus, and potassium, by mass, respectively). Potassium nitrate was once thought to induce impotence, and is still falsely rumored to be in institutional food (such as military fare) as an aphrodisiac; these uses would be ineffective, since potassium nitrate has no such properties.^[2] However, potassium nitrate and other nitrates do successfully combat high blood pressure and are used medically to relieve angina.

History of production


Historically, nitre-beds were prepared by mixing manure with either mortar or wood ashes, common earth and organic materials such as straw to give porosity to a compost pile typically 1.5 meters high by 2 meters wide by 5 metres long.^[3] The heap was usually under a cover from the rain, kept moist with urine, turned often to accelerate the decomposition and leached with water after approximately one year. The liquid containing various nitrates was then converted with wood ashes to potassium nitrates, crystallized and refined for use in gunpowder.

In more rural times, urine was collected and used in the manufacture of gunpowder. Stale urine was filtered through a barrel full of straw and allowed to continue to sour for a year or more. After this period of time, water was used to wash the resulting chemical salts from the straw. This slurry was filtered through wood ashes and allowed to dry in the sun. Saltpeter crystals were then collected and added to brimstone and charcoal to create black powder.

Potassium nitrate could also be harvested from accumulations of bat guano in caves. This was the traditional method used in Laos for the manufacture of gunpowder for Bang Fai rockets.

The earliest known complete purification process for potassium nitrate is described in 1270 by the Arab chemist and engineer Hasan al-Rammah of Syria in his book *al-Furusiyya wa al-Manasib al-Harbiyya* (*The Book of Military Horsemanship and Ingenious War Devices*), where he first described the use of potassium carbonate (in the form of wood ashes) to remove calcium and magnesium salts from the potassium nitrate.^[4]

During the 19th century and until around World War I, potassium nitrate was produced on an industrial scale, first by the Birkeland-Eyde process in 1905, and then later from ammonia produced by the much more efficient Haber process. The latter process came online during World War I, and supplied Germany with nitrates critical for the warfare that it otherwise had no access to because the deposits of natural nitrate in Chile were in British hands. It is assumed that this prolonged World War I. Today practically all nitrates are produced with ammonia from the Haber process.

NFPA 704	
R-phrases	8 ^[1]
S-phrases	17, 24/25 ^[1]
Related compounds	
Other anions	Potassium nitrite
Other cations	Lithium nitrate Sodium nitrate Rubidium nitrate Caesium nitrate
Supplementary data page	
Structure and properties	<i>n</i> , ϵ_r , etc.
Thermodynamic data	Phase behaviour Solid, liquid, gas
Spectral data	UV, IR, NMR, MS
Except where noted otherwise, data are given for materials in their standard state (at 25 °C, 100 kPa) Infobox references	

Applications

Potassium nitrate is also used as a fertilizer, in amateur rocket propellant, and in several fireworks such as smoke bombs.

In the process of food preservation, potassium nitrate has been a common ingredient of salted meat since the Middle Ages, but its use has been mostly discontinued due to health concerns over nitrates. Even so, saltpeter is still used in some food applications, such as charcuterie and the brine used to make corned beef.^[5] Sodium nitrate (and nitrite) have mostly supplanted saltpeter's culinary usage, as they are more reliable in preventing bacterial infection than saltpeter. All three give cured salami and corned beef their characteristic pink hue.

In the European Union, it is referred to as E252.

It is commonly used in pre-rolled cigarettes to maintain an even burn of the tobacco.^[6]

Potassium nitrate is also the main component (usually about 98%) of tree stump remover: it accelerates

2. ^ "The Straight Dope: Does saltpeter suppress male ardor?" (16 June 1989). Retrieved on 2007-10-19.
3. ^ "Joseph Leconte, 1823-1901 - Instructions for the Manufacture of Saltpeter". Joseph LeConte (1862). Retrieved on 2007-10-19.
4. ^ Ahmad Y Hassan, Potassium Nitrate in Arabic and Latin Sources, *History of Science and Technology in Islam*.
5. ^ Corned Beef, Food Network
6. ^ Inorganic Additives for the Improvement of Tobacco, TobaccoDocuments.org
7. ^ Stump Remover MSDS, spectracide.com
8. ^ "Sensodyne Toothpaste for Sensitive Teeth" (2008-08-03). Retrieved on 2008-08-03.
9. ^ "Potassium containing toothpastes for dentine hypersensitivity" (May 23, 2006). Retrieved on 2007-10-19.

Literature

- Dennis W. Barnum. (2003). "Some History of Nitrates." *Journal of Chemical Education*. v. 80, p. 1393-. link.
- Alan Williams: *The production of saltpeter in the middle ages*, Ambix, 22 (1975), p. 125-33. Maney Publishing, ISSN 0002-6980.

External links

- International Chemical Safety Card 018402216
- "INSTRUCTIONS FOR THE MANUFACTURE OF SALTPETER" - by Joseph Leconte, professor of chemistry and geology in South Carolina College

Retrieved from "http://en.wikipedia.org/wiki/Potassium_nitrate"

Categories: Nitrates | Potassium compounds | Salts | Pyrotechnic oxidizers | Preservatives | Agricultural chemicals

Hidden categories: All articles with unsourced statements | Articles with unsourced statements since October 2007 | Articles with unsourced statements since October 2008 | Articles with unsourced statements since April 2008

- This page was last modified on 10 November 2008, at 15:22.
- All text is available under the terms of the GNU Free Documentation License. (See **Copyrights** for details.)
Wikipedia® is a registered trademark of the Wikimedia Foundation, Inc., a U.S. registered 501(c)(3) tax-deductible nonprofit charity.