

 Product Overview:

- **Product Name:** Sodium Carbonate
- **CAS Number:** 497-19-8
- **IUPAC Name:** Disodium carbonate
- **Molecular Formula:** Na₂CO₃
- **Synonyms:** Soda Ash, Disodium carbonate, Soda crystals, Sodium carbonate anhydrous, Washing soda, and more.

 Chemical and Physical Properties:

- **Molecular Weight:** 105.99 g/mol
- **Density:** 2.54 g/cm³
- **Melting Point:** 856 °C
- **Boiling Point:** Decomposes on heating by CO₂ loss.
- **Solubility:** Freely soluble in water, insoluble in ethanol.
- **Appearance:** White hygroscopic powder, colorless crystals, or grayish-white lumps.
- **Refractive Index:** 1.535
- **pH:** Aqueous solutions are strongly alkaline.

 Safety and Hazards:

- **Primary Hazard:** Irritant (GHS07 symbol)
- **Safety Precautions:** Avoid contact with eyes and skin. Wear suitable protective clothing, gloves, and eye/face protection.
- **Handling:** Store in a dry place, away from acids and moisture.

 Regulatory Information:

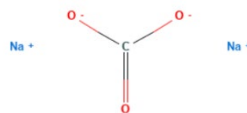
- **FDA:** Approved as an **active ingredient** for veterinary and human use.
- **EU Pesticides Database:** Not approved for pesticide use under Regulation (EC) No 1107/2009.
- **EINECS Number:** 207-838-8 (for regulatory and classification purposes in Europe).

 Pharmacological Data:

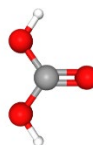
- **Therapeutic Uses:** Used topically for dermatitides and as a mouthwash or vaginal douche. Also used for emergency veterinary applications as an emetic.
- **Mechanism of Action:** Acts as an alkalizing agent, neutralizing stomach acid.

✓ Structural Information:

- **2D Structure:**



- **3D Conformer:**



✓ Spectral Data (Optional):

- **NMR Spectra:** Available upon request.
- **IR Spectra:** Available upon request.
- **Raman Spectra:** Available upon request.

✓ Vendors and Supply Chain:

- **Suppliers:** Chemical vendors, curators, and government organizations supply Sodium Carbonate.
- **Purchase Links:** Available via external links to vendors and chemical suppliers.

✓ Related Chemicals:

- **Related Compounds:** Sodium Carbonate Monohydrate (CID-2735133), Sodium Carbonate Decahydrate (CID-151402), and more.

✓ Price and Availability:

- **Bulk Pricing:** Available on request.
- **Packaging:** Typically available in 25 kg, 50 kg, or custom packaging sizes.

✓ Applications:

1. Glass Industry:

- **Sodium Carbonate** is a key component in the production of **glass**, particularly **soda-lime glass**. It is used as a fluxing agent in the manufacturing of glass products such as windows, containers, and fiberglass.
- **Material Interaction:** Combines with **silica** (SiO₂) to lower the melting point of the mixture, facilitating the creation of glass at lower temperatures.

2. Detergents and Cleaning Products:



- Sodium carbonate, commonly referred to as **washing soda**, is used in **laundry detergents** and household **cleaning products**. It helps soften water and aids in the removal of grease, oil, and dirt.
 - **Material Interaction:** Acts as a **water softener**, preventing calcium and magnesium ions from interfering with the cleaning action.
- 3. Water Treatment:**
- Used in **water softening** and **treatment processes** to reduce water hardness. It reacts with calcium and magnesium ions in the water to form insoluble salts.
 - **Material Interaction:** Forms **calcium carbonate (CaCO_3)** and **magnesium carbonate (MgCO_3)**, which are precipitated out of the water, making it softer.
- 4. Textile Industry:**
- In **textile processing**, **Sodium Carbonate** is used to remove **dyes** and to adjust the pH in **bleaching** and **washing** processes.
 - **Material Interaction:** Facilitates the breakdown of organic impurities during the textile **dyeing process** and aids in **stabilizing pH** levels in various textile treatments.
- 5. Petroleum Refining:**
- Sodium carbonate is used in **petroleum refining** to treat crude oil and remove sulfur compounds (desulfurization) and other impurities.
 - **Material Interaction:** Neutralizes acidic impurities, improving the quality of refined petroleum products.
- 6. Chemical Manufacturing:**
- It serves as an important **intermediate compound** in the production of various **chemicals**, such as **sodium bicarbonate** (baking soda), **sodium silicate**, **sodium phosphate**, and others.
 - **Material Interaction:** Reacts with **carbon dioxide** to produce sodium bicarbonate and combines with silica to form sodium silicate, both of which are used in other chemical processes.
- 7. Paper Industry:**
- **Sodium Carbonate** is used in the **kraft process** for wood pulp production in the paper industry. It helps in breaking down the lignin in wood, making the cellulose fibers easier to extract.
 - **Material Interaction:** Acts as a **chemical pulping agent**, allowing for the extraction of cellulose fibers needed for paper.
- 8. Food Industry:**
- **Sodium Carbonate** is used in the food industry as a **leavening agent**, **acidity regulator**, and **buffering agent**.
 - **Materials Interaction:** Reacts with **acids** to release carbon dioxide gas, which aids in **leavening** baked goods like crackers and cookies.
- 9. Pharmaceuticals:**
- Used in the formulation of **oral antacid products**, where it neutralizes stomach acid.



- **Material Interaction:** Reacts with gastric **hydrochloric acid (HCl)** to produce **carbon dioxide (CO₂)**, which relieves indigestion and heartburn.
- 10. Agriculture:**
- **Sodium Carbonate** is used in **agriculture** for soil **pH adjustment** and as a **fungicide**.
 - **Material Interaction:** Increases soil **alkalinity**, making it suitable for crops that prefer alkaline conditions.
- 11. Mining:**
- **Sodium Carbonate** is involved in the extraction of **metals** and minerals from ores, particularly in processes like **uranium and lithium extraction**.
 - **Material Interaction:** Acts as a flux in smelting processes to reduce the melting point of ores.
- 12. Cosmetics and Personal Care:**
- **Sodium Carbonate** is used as a **pH regulator** in cosmetics and personal care products, including **shampoos, soaps, and bath products**.
 - **Material Interaction:** Ensures the products maintain the correct pH balance for skin compatibility.
- 13. Ceramics:**
- Used in **ceramics and porcelain production** as a **fluxing agent** to lower the melting point of silica, aiding in the creation of ceramics and porcelain.
 - **Material Interaction:** Reduces the **melting temperature** of the mixture of clay and silica, allowing it to form the desired shape at lower temperatures.
- 14. Laboratory Reagents:**
- Used in **chemical laboratories** for **titration** processes, **buffer solutions**, and as a **reagent** in various analytical techniques.
 - **Material Interaction:** Used to create **buffer solutions** that maintain a stable pH during chemical reactions.
- 15. Battery Manufacturing:**
- **Sodium Carbonate** is used in the production of **sodium-ion batteries** as a source of sodium in some battery technologies.
 - **Material Interaction:** Provides the **sodium ions** necessary for the battery's electrochemical reactions.
- 16. Fire Extinguishers:**
- Sodium carbonate is used in the manufacturing of **dry chemical fire extinguishers**.
 - **Material Interaction:** Acts as a **fire suppressant**, particularly for grease fires.