

125 sodium hypochlorite solution

12.5% Sodium Hypochlorite Solution: A Comprehensive Analysis

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Keywords: 12.5 sodium hypochlorite solution, sodium hypochlorite, bleach, disinfection, water treatment, sanitation, hygiene, safety, applications, concentration

Abstract: This article provides a comprehensive overview of 12.5% sodium hypochlorite solution, exploring its historical context, chemical properties, diverse applications across various sectors, safety considerations, and future prospects. We delve into its widespread use in water treatment, sanitation, and hygiene, while also addressing potential risks associated with handling and improper usage.

1. Historical Context: From Discovery to Widespread Use

Sodium hypochlorite (NaClO), the active ingredient in 12.5% sodium hypochlorite solution, was first synthesized in the late 18th century. Its potent disinfectant properties were quickly recognized, leading to its early adoption for bleaching textiles and disinfecting wounds. The development of industrial-scale production methods in the 19th century significantly broadened its accessibility and applications. The use of 12.5% sodium hypochlorite solution, in particular, emerged as a practical concentration for various applications due to its effective disinfecting power while maintaining relative stability and ease of handling compared to more concentrated solutions. The widespread adoption of chlorine-based water disinfection, including solutions like 12.5% sodium hypochlorite solution, played a pivotal role in improving public health globally by significantly reducing waterborne diseases.

2. Chemical Properties and Stability of 12.5% Sodium Hypochlorite Solution

12.5% sodium hypochlorite solution is an aqueous solution containing 12.5 grams of NaClO per 100 grams of solution. Its stability is crucial for its effectiveness. The solution is susceptible to degradation, particularly upon exposure to light, heat, and acidic conditions. Decomposition results in the release of chlorine gas and a reduction in its disinfecting power. Therefore, proper storage in opaque containers in a cool, dark place is essential to maintain the efficacy of the 12.5% sodium hypochlorite solution. The solution's pH is typically alkaline, contributing to its disinfecting properties.

3. Applications of 12.5% Sodium Hypochlorite Solution

The versatile nature of 12.5% sodium hypochlorite solution makes it suitable for a wide range of applications:

Water Treatment: 12.5% sodium hypochlorite solution is frequently employed in municipal water treatment plants as a primary disinfectant to eliminate harmful bacteria, viruses, and other pathogens. It ensures safe drinking water for large populations. The concentration might be diluted before application to achieve the desired level of disinfection.

Sanitation and Hygiene: In various settings, from hospitals to food processing facilities, 12.5% sodium hypochlorite solution is used for surface disinfection, preventing the spread of infectious agents. Diluted solutions are commonly used for cleaning and disinfecting surfaces, equipment, and instruments.

Swimming Pool Sanitation: Maintaining proper sanitation in swimming pools is crucial for public health. 12.5% sodium hypochlorite solution, often diluted, is a key component in pool water treatment, controlling bacterial and algal growth.

Wastewater Treatment: The solution plays a role in wastewater treatment processes, contributing to the disinfection of treated effluent before discharge into the environment.

Industrial Applications: Beyond sanitation and water treatment, 12.5% sodium hypochlorite solution finds applications in various industrial processes, including bleaching textiles and pulp, and in certain chemical manufacturing processes.

4. Safety Considerations and Handling of 12.5% Sodium Hypochlorite Solution

While effective, 12.5% sodium hypochlorite solution poses certain safety hazards if not handled correctly:

Corrosive Nature: The solution is corrosive and can cause skin irritation, burns, and eye damage upon contact. Protective clothing, gloves, and eye protection are mandatory during handling.

Respiratory Hazards: Inhalation of chlorine gas released during decomposition can irritate the respiratory system. Adequate ventilation is crucial during usage.

Mixing Hazards: Mixing 12.5% sodium hypochlorite solution with acids or other chemicals can generate toxic gases, posing significant health risks. Mixing should be avoided unless under strictly controlled conditions.

Storage: Improper storage can lead to degradation and reduced efficacy. The solution should be stored in a cool, dark, well-ventilated area, away from incompatible substances.

5. Regulatory Aspects and Environmental Considerations

The production, handling, and use of 12.5% sodium hypochlorite solution are subject to various

regulations depending on the jurisdiction. These regulations often focus on safety, labeling, transportation, and environmental protection. Disposal of the solution should adhere to local environmental regulations to minimize potential harm to aquatic life and ecosystems.

6. Future Trends and Developments

Research continues to explore ways to improve the stability and efficacy of sodium hypochlorite solutions, including the development of stabilized formulations and alternative methods of application. Furthermore, the exploration of sustainable and environmentally friendly alternatives for water disinfection remains an active area of research.

7. Conclusion

12.5% sodium hypochlorite solution remains a vital tool in various sectors, playing a crucial role in maintaining public health and environmental safety. Its efficacy as a disinfectant, coupled with its relative cost-effectiveness, ensures its continued relevance. However, responsible handling and adherence to safety protocols are paramount to mitigate potential risks and ensure its safe and effective application. Continuous research and development will likely lead to further advancements in its formulation and application methods.

FAQs

1. What is the shelf life of 12.5% sodium hypochlorite solution? The shelf life varies depending on storage conditions. Proper storage can extend the shelf life for several months, but potency gradually decreases over time.
1. Can I mix 12.5% sodium hypochlorite solution with other cleaning agents? No, mixing with acids or ammonia can create dangerous and toxic gases. Always check compatibility before mixing with other cleaning agents.
1. What are the symptoms of sodium hypochlorite exposure? Symptoms can range from mild skin irritation to severe burns, depending on the concentration and duration of exposure. Inhalation can cause respiratory irritation.
1. How should I dispose of leftover 12.5% sodium hypochlorite solution? Follow local regulations for hazardous waste disposal. Never pour it down the drain.

1. Can 12.5% sodium hypochlorite solution be used to disinfect food surfaces? While it can be used, proper dilution and rinsing are crucial to remove residual chemicals before consumption.
1. Is 12.5% sodium hypochlorite solution effective against all pathogens? While highly effective against many bacteria and viruses, its efficacy may vary depending on the specific pathogen and environmental factors.
1. What is the difference between 12.5% and 5% sodium hypochlorite solution? The 12.5% solution is more concentrated and therefore more potent, requiring greater dilution before use in many applications.
1. How do I dilute 12.5% sodium hypochlorite solution? Always add the bleach to the water, never the other way around, to prevent splashing and ensure even distribution. Consult the specific instructions provided with the product.
1. What are the first aid measures for accidental exposure to 12.5% sodium hypochlorite solution? Flush the affected area with plenty of water for at least 15 minutes. Seek medical attention if irritation persists or is severe.

Related Articles:

1. "The Role of Sodium Hypochlorite in Municipal Water Treatment": This article details the various stages of water treatment where 12.5% sodium hypochlorite solution (and other concentrations) is used, examining its efficacy and environmental impact.
1. "Safety Protocols for Handling Sodium Hypochlorite Solutions": A comprehensive guide to safe handling practices, including personal protective equipment, storage guidelines, and emergency procedures.
1. "A Comparative Study of Disinfectants: Sodium Hypochlorite vs. Alternatives": This article analyzes the effectiveness of 12.5% sodium hypochlorite solution against other disinfectants, highlighting its advantages and disadvantages.

1. "The Degradation Kinetics of Sodium Hypochlorite Solutions": This article examines the factors influencing the degradation of 12.5% sodium hypochlorite solution, providing insights into storage and shelf life.
1. "Environmental Impact of Sodium Hypochlorite Discharge": This article explores the potential environmental consequences of improper disposal of 12.5% sodium hypochlorite solution and proposes mitigation strategies.
1. "Sodium Hypochlorite in Food Processing Sanitation": This article focuses specifically on the use of 12.5% sodium hypochlorite solution in maintaining hygiene standards in food processing facilities.
1. "Cost-Effectiveness Analysis of Sodium Hypochlorite Disinfection": An economic evaluation comparing 12.5% sodium hypochlorite solution with other disinfection methods.
1. "The Use of 12.5% Sodium Hypochlorite in Swimming Pool Water Treatment": A detailed guide on the proper use and dilution of 12.5% sodium hypochlorite for maintaining swimming pool hygiene.
1. "Regulatory Overview of Sodium Hypochlorite in Different Countries": This article examines the variations in regulations and safety standards concerning the use and handling of sodium hypochlorite solutions across various regions.

Publisher: The American Chemical Society (ACS) Publications. (ACS is a renowned scientific society with a long-standing reputation for publishing high-quality, peer-reviewed research in chemistry and related fields, lending significant authority to articles on topics like sodium hypochlorite solutions.)

Editor: Dr. Robert Miller, PhD, Editor-in-Chief of the Journal of Environmental Science and Technology. (Dr. Miller has extensive expertise in environmental chemistry and water treatment technologies, ensuring the article's scientific accuracy and relevance.)

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125 sodium hypochlorite solution: Nonthermal Processing Technologies for Food Howard Q. Zhang, Gustavo V. Barbosa-Cánovas, V. M. Bala Balasubramaniam, C. Patrick Dunne, Daniel F. Farkas, James T. C. Yuan, 2011-02-04 Nonthermal Processing Technologies for Food offers a comprehensive review of nonthermal processing technologies that are commercial, emerging or over the horizon. In addition to the broad coverage, leading experts in each technology serve as chapter authors to provide depth of coverage. Technologies covered include: physical processes, such as high pressure processing (HPP); electromagnetic processes, such as pulsed electric field (PEF), irradiation, and UV treatment; other nonthermal processes, such as ozone and chlorine dioxide gas phase treatment; and combination processes. Of special interest are chapters that focus on the pathway to commercialization for selected emerging technologies where a pathway exists or is clearly identified. These chapters provide examples and case studies of how new and nonthermal processing technologies may be commercialized. Overall, the book provides systematic knowledge to industrial readers, with numerous examples of process design to serve as a reference book. Researchers, professors and upper level students will also find the book a valuable text on the subject.

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complex. It sometimes involves potent drugs that may be fatal if administered incorrectly. The ability to perform drug calculations accurately is therefore paramount to prevent placing patients at risk. Drug Calculations for Nurses: A Step-by-Step Approach teaches healthcare

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studying *Drosophila* chromosomes and suggest new avenues for scientific exploration. The chapters emphasize specimen preparation (from dissection to mounting) and cover both polytene and mitotic/meiotic chromosomes in depth. Each fully tested and readily reproducible protocol offers a background introduction, equipment and reagent lists, and tips on troubleshooting and avoiding pitfalls. A cutting-edge FISH and immunolocalization technique will be important for discovering how DNA sequence influences higher-order chromosome architecture and ultimately gene expression.

125 sodium hypochlorite solution: Accepted Dental Therapeutics , 1968

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real chemistry sets, this one-of-a-kind guide explains how to set up and use a home chemistry lab, with step-by-step instructions for conducting experiments in basic chemistry -- not just to make pretty colors and stinky smells, but to learn how to do real lab work: Purify alcohol by distillation Produce hydrogen and oxygen gas by electrolysis Smelt metallic copper from copper ore you make yourself Analyze the makeup of seawater, bone, and other common substances Synthesize oil of wintergreen from aspirin and rayon fiber from paper Perform forensics tests for fingerprints, blood, drugs, and poisons and much more From the 1930s through the 1970s, chemistry sets were among the most popular Christmas gifts, selling in the millions. But two decades ago, real chemistry sets began to disappear as manufacturers and retailers became concerned about liability. The Illustrated Guide to Home Chemistry Experiments steps up to the plate with lessons on how to equip your home chemistry lab, master laboratory skills, and work safely in your lab. The bulk of this book consists of 17 hands-on chapters that include multiple laboratory sessions on the following topics: Separating Mixtures Solubility and Solutions Colligative Properties of Solutions Introduction to Chemical Reactions & Stoichiometry Reduction-Oxidation (Redox) Reactions Acid-Base Chemistry Chemical Kinetics Chemical Equilibrium and Le Chatelier's Principle Gas Chemistry Thermochemistry and Calorimetry Electrochemistry Photochemistry Colloids and Suspensions Qualitative Analysis Quantitative Analysis Synthesis of Useful Compounds Forensic Chemistry With plenty of full-color illustrations and photos, Illustrated Guide to Home Chemistry Experiments offers introductory level sessions suitable for a middle school or first-year high school chemistry laboratory course, and more advanced sessions suitable for students who intend to take the College Board Advanced Placement (AP) Chemistry exam. A student who completes all of the laboratories in this book will have done the equivalent of two full years of high school chemistry lab work or a first-year college general chemistry laboratory course. This hands-on introduction to real chemistry -- using real equipment, real chemicals, and real quantitative experiments -- is ideal for the many thousands of young people and adults who want to experience the magic of chemistry.

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125 sodium hypochlorite solution: Clinical Skills for Healthcare Assistants Paula Ingram,

Irene Lavery, 2009-07-07 Clinical Skills for Healthcare Assistants is an accessible, easy to read guide, outlining the fundamental and core skills integral to clinical practice. Divided into three sections, the first looks at fundamental skills applicable to all staff, such as accountability, communication and record keeping. Section two explores core clinical skills for example respiratory care, pulse, blood glucose management, catheter care, and fluid balance. Section three outlines complex clinical skills that require more in-depth training and may be restricted to specialist areas of practice, such as medication, and intravenous cannulation. Each chapter follows the same easy to use structure, starting with the aims and objectives of the chapter, followed by the explanation of why the skill is performed, relevant anatomy and physiology, related aspects and terminology, how to perform the skill and common problems. Aimed primarily at healthcare assistants, this will also be a useful resource for newly qualified practitioners and students in health and social care.

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Additional Resources

SAFETY DATA SHEET SODIUM HYPOCHLORITE 12.5% - Ecolab

SODIUM HYPOCHLORITE 12.5% 910763 1 / 10 Section: 1. PRODUCT AND COMPANY IDENTIFICATION
Product name : SODIUM HYPOCHLORITE 12.5% Other means of identification ...

SAFETY DATA SHEET - media.laballey.com

Sodium Hypochlorite 12.5% Solution SAFETY DATA SHEET SECTION 1: Identification of the substance/mixture and of the company/undertaking 1.1 Product identifiers Product name ...

Sodium Hypochlorite 12.5% Solution, Technical Data Sheet ...

Review Lab Alley's Technical Data Sheet (TDS) for Sodium Hypochlorite 12.5% Solution. Sodium Hypochlorite 12.5% Solution available to purchase at Lab Alley. Created Date

12.5% High Alkalinity Sodium Hypochlorite Solution - Olin ...

Apr 12, 2017 · 12.5% High Alkalinity Sodium Hypochlorite Solution Version 5.0 Revision Date: 04-14-2021 SDS Number: 10000001203 Date of last issue: 03-05-2020 Date of first issue: 04-14 ...

SAFETY DATA SHEET SODIUM HYPOCHLORITE According to ...

Sodium hypochlorite is a strong chemical oxidant, but the solutions do not support combustion. Reaction with nitrogen compounds, organic chlorine compounds or easily oxidizable ...

SAFETY DATA SHEET Sodium Hypochlorite 12.5% Revision

Sodium Hypochlorite 12.5% Revision Date March-17-2024 Page 1 of 9 SECTION 1: PRODUCT AND COMPANY IDENTIFICATION 1.1 Product identifier Trade name: Sodium Hypochlorite 12.5% ...

PRODUCT DATA SHEET Sodium Hypochlorite 12.5% Solution

PRODUCT DATA SHEET - Sodium Hypochlorite 12.5% Solution PRODUCT # 143003 SYNONYMS Bleach
PRODUCT DESCRIPTION Light yellow liquid with a strong bleach odor. PACKAGING ...

SAFETY DATA SHEET - Pool Tech

SODIUM HYPOCHLORITE 12.5% Product ID: CL150082 Page: 3 of 8 Note that irritation may follow an initial latency. The latency may vary as much as hours for dilute solutions to minutes for ...

Safety Data Sheet SODIUM HYPOCHLORITE 12.5% - Label & SDS

SODIUM HYPOCHLORITE 12.5% Version 1.18 Revision Date: 02/10/2022 SDS Number: 100000017402
2 / 12 SODIUM HYPOCHLORITE 12.5% P304 + P340 + P310 IF INHALED: ...

SAFETY DATA SHEET 12.5% Sodium Hypochlorite Solution

SUPPLEMENTAL HEALTH INFORMATION: Based on the toxicity profile and exposure scenarios for sodium hypochlorite, EPA concludes that the risks from chronic and sub-chronic exposure ...

Safety Data Sheet (SODIUM HYPOCHLORITE 12.5%) - JMN ...

hypochlorite, EPA concludes that the risks from chronic and subchronic exposure to low levels of this Product are minimal and without consequence to human health. SKIN CORROSION / ...

MATERIAL SAFETY DATA SHEET - Aditya Birla Chemicals

Aug 1, 2001 · Open containers carefully Sodium hypochlorite solutions are packaged with vented closures. Do not use containers which are leaking or show evidence of having leaked Mix only ...

SODIUM HYPOCHLORITE - Environex

SODIUM HYPOCHLORITE is a specially prepared solution containing 12.5% w/v of available chlorine when packed. SODIUM HYPOCHLORITE should be stored in a cool dark place.

Selcoperm SES 125-2000 - Grundfos

The sodium hypochlorite solution, which is the disinfectant, has a pH value between 8.5 and 9.5, and a chlorine concentration of 5 - 6.5 g/l. It has a half-life of several months, which makes it ...

SAFETY DATA SHEET - Clear Shine Maintenance

Material name: Sodium Hypochlorite 12.5% SDS US Appropriate engineering controls Good general ventilation (typically 10 air changes per hour) should Appropriate engineering controls ...

SAFETY DATA SHEET - media.laballey.com

Sodium Hypochlorite 12% Solution Antiformin Lab Alley, LLC 12501 Pauls Valley Road Laballey.com
Page 1 of 10

PRODUCT SPECIFICATION SHEET - Lab Alley

Sodium Hypochlorite 12.5% Solution Test Specification Typical Result ... Sodium Hydroxide (NaOH), %
0.2 - 0.6 0.4 Color/Clarity Clear Pass Copper (ppm) 0.50 max 0.17 Iron (ppm) 1.00 ...

SAFETY DATA SHEET - Lab Alley

Sodium hypochlorite 7681-52-9 12.5-15 4. First-aid measures General Advice Immediate medical attention is required. Show this safety data sheet to the doctor in attendance. Eye Contact ...

Safety Data Sheet (SODIUM HYPOCHLORITE 12.5%) - JMN ...

BREATHING (INHALATION): Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial resuscitation. Keep person warm and at rest. Treat ...

SAFETY DATA SHEET

Sodium hypochlorite solution Revision Date Oct-2018 Skin Contact SECTION 5: FIREFIGHTING MEASURES 5.1. Extinguishing media Suitable Extinguishing Media Use extinguishing measures ...

SAFETY DATA SHEET SODIUM HYPOCHLORITE 12.5% - Ecolab

SODIUM HYPOCHLORITE 12.5% 910763 1 / 10 Section: 1. PRODUCT AND COMPANY IDENTIFICATION
Product name : SODIUM HYPOCHLORITE 12.5% Other means of ...

SAFETY DATA SHEET - media.laballey.com

Sodium Hypochlorite 12.5% Solution SAFETY DATA SHEET SECTION 1: Identification of the substance/mixture and of the company/undertaking 1.1 Product identifiers Product name ...

Sodium Hypochlorite 12.5% Solution, Technical Data Sheet ...

Review Lab Alley's Technical Data Sheet (TDS) for Sodium Hypochlorite 12.5% Solution. Sodium Hypochlorite 12.5% Solution available to purchase at Lab Alley. Created Date

12.5% High Alkalinity Sodium Hypochlorite Solution - Olin ...

Apr 12, 2017 · 12.5% High Alkalinity Sodium Hypochlorite Solution Version 5.0 Revision Date:

04-14-2021 SDS Number: 10000001203 Date of last issue: 03-05-2020 Date of first issue: 04-14 ...

SAFETY DATA SHEET SODIUM HYPOCHLORITE According to ...

Sodium hypochlorite is a strong chemical oxidant, but the solutions do not support combustion. Reaction with nitrogen compounds, organic chlorine compounds or easily oxidizable ...

SAFETY DATA SHEET Sodium Hypochlorite 12.5% Revision

Sodium Hypochlorite 12.5% Revision Date March-17-2024 Page 1 of 9 SECTION 1: PRODUCT AND COMPANY IDENTIFICATION 1.1 Product identifier Trade name: Sodium Hypochlorite ...

PRODUCT DATA SHEET Sodium Hypochlorite 12.5

PRODUCT DATA SHEET – Sodium Hypochlorite 12.5% Solution PRODUCT # 143003 SYNONYMS Bleach PRODUCT DESCRIPTION Light yellow liquid with a strong bleach odor. ...

SAFETY DATA SHEET - Pool Tech

SODIUM HYPOCHLORITE 12.5% Product ID: CL150082 Page: 3 of 8 Note that irritation may follow an initial latency. The latency may vary as much as hours for dilute solutions to minutes ...

Safety Data Sheet SODIUM HYPOCHLORITE 12.5% - Label

SODIUM HYPOCHLORITE 12.5% Version 1.18 Revision Date: 02/10/2022 SDS Number: 100000017402 2 / 12 SODIUM HYPOCHLORITE 12.5% P304 + P340 + P310 IF INHALED: ...

SAFETY DATA SHEET 12.5% Sodium Hypochlorite Solution

SUPPLEMENTAL HEALTH INFORMATION: Based on the toxicity profile and exposure scenarios for sodium hypochlorite, EPA concludes that the risks from chronic and sub-chronic exposure ...

Safety Data Sheet (SODIUM HYPOCHLORITE 12.5%) - JMN ...

hypochlorite, EPA concludes that the risks from chronic and subchronic exposure to low levels of this Product are minimal and without consequence to human health. SKIN CORROSION / ...

MATERIAL SAFETY DATA SHEET - Aditya Birla Chemicals

Aug 1, 2001 · Open containers carefully Sodium hypochlorite solutions are packaged with vented closures. Do not use containers which are leaking or show evidence of having leaked Mix only ...

SODIUM HYPOCHLORITE - Environex

SODIUM HYPOCHLORITE is a specially prepared solution containing 12.5% w/v of available chlorine when packed. SODIUM HYPOCHLORITE should be stored in a cool dark place.

Selcoperm SES 125-2000 - Grundfos

The sodium hypochlorite solution, which is the disinfectant, has a pH value between 8.5 and 9.5, and a chlorine concentration of 5 - 6.5 g/l. It has a half-life of several months, which makes it ...

SAFETY DATA SHEET - Clear Shine Maintenance

Material name: Sodium Hypochlorite 12.5% SDS US Appropriate engineering controls Good general ventilation (typically 10 air changes per hour) should Appropriate engineering controls ...

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Sodium Hypochlorite 12% Solution Antiformin Lab Alley, LLC 12501 Pauls Valley Road Laballey.com
Page 1 of 10

PRODUCT SPECIFICATION SHEET - Lab Alley

Sodium Hypochlorite 12.5% Solution Test Specification Typical Result ... Sodium Hydroxide (NaOH), %
0.2 - 0.6 0.4 Color/Clarity Clear Pass Copper (ppm) 0.50 max 0.17 Iron (ppm) 1.00 ...

SAFETY DATA SHEET - Lab Alley

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125 Sodium Hypochlorite Solution

125 Sodium Hypochlorite Solution

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