

a solution is made by dissolving 60 g of naoh

A Deep Dive into the Properties and Implications of a Solution Made by Dissolving 60g of NaOH

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Editor: Professor David Lee, PhD, a veteran editor with over 20 years' experience in publishing scientific journals, specializing in analytical chemistry and chemical process safety. His expertise ensures the accuracy and clarity of the published material, especially concerning potentially hazardous chemicals like the NaOH solution discussed here.

Keywords: NaOH solution, sodium hydroxide solution, 60g NaOH solution, solution preparation, molarity, concentration, solubility, exothermic reaction, safety precautions, heat of dissolution, chemical properties, applications, industrial uses.

1. Introduction: Understanding the Implications of Dissolving 60g of NaOH

This report thoroughly investigates the properties and implications of preparing a solution by dissolving 60g of sodium hydroxide (NaOH) in a solvent, typically water. This seemingly simple process has significant chemical and practical ramifications, requiring careful consideration of safety and accurate measurement techniques. A solution is made by dissolving 60g of NaOH, and the resulting properties depend heavily on the final volume of the solution and the temperature. This report delves into the details of this process, exploring its physical and chemical characteristics and outlining crucial safety considerations.

2. The Dissolution Process: An Exothermic Reaction

When a solution is made by dissolving 60g of NaOH in water, a significant exothermic reaction occurs. The dissolution of NaOH is highly exothermic; the strong ionic bonds between Na^+ and OH^- ions are broken, and these ions are hydrated by water molecules. This hydration process releases a considerable amount of heat, causing a notable temperature increase in the solution. The magnitude of this temperature rise depends on factors such as the initial temperature of the water, the rate of dissolution, and the final volume of the solution. Failure to account for this heat generation can lead to uncontrolled temperature increases, potentially causing splashing, boiling, and even burns.

3. Calculating Molarity and Concentration: A Crucial Step

To accurately understand the properties of a solution made by dissolving 60g of NaOH, it is vital to determine its molarity (moles of solute per liter of solution) and concentration. The molar mass of NaOH is approximately 40 g/mol. Therefore, 60g of NaOH represents $60\text{g} / (40\text{ g/mol}) = 1.5$ moles of NaOH. The molarity will vary depending on the final volume of the solution. For example:

In 1 Liter of water: The molarity would be 1.5 M (1.5 moles/liter).

In 0.5 Liters of water: The molarity would be 3.0 M (1.5 moles/0.5 liters).

This highlights the critical importance of precise volume measurement when preparing a solution. A solution is made by dissolving 60g of NaOH, and its concentration directly influences its reactivity and applications.

4. Safety Precautions: Handling a Strong Base

NaOH is a highly corrosive strong base. Working with a solution made by dissolving 60g of NaOH demands rigorous adherence to safety protocols. These precautions include:

Eye protection: Safety goggles are mandatory to prevent eye damage from splashes.

Gloves: Chemical-resistant gloves should be worn to avoid skin burns.

Lab coat: A lab coat provides additional protection for clothing and skin.

Ventilation: The dissolution process should be carried out under a well-ventilated hood to minimize inhalation of NaOH fumes.

Slow addition: NaOH should be added slowly and carefully to the water, stirring continuously to dissipate the heat generated. Never add water to NaOH.

Emergency procedures: A readily available eyewash station and safety shower are crucial in case of accidents.

Ignoring these safety measures can lead to severe injuries. A solution is made by dissolving 60g of NaOH; therefore, safe handling is paramount.

5. Applications of a 60g NaOH Solution

The applications of a solution made by dissolving 60g of NaOH depend heavily on its final concentration. Various concentrations find utility in diverse fields:

Industrial cleaning: Lower concentrations are used for cleaning and degreasing in various industrial settings.

Chemical synthesis: Precise concentrations are crucial in chemical reactions as a base catalyst or reactant.

Wastewater treatment: NaOH is used to neutralize acidic waste streams.

Soap making: NaOH (lye) is a key ingredient in traditional soap manufacturing.

The specific application determines the required concentration and necessitates careful preparation and handling of the solution. A solution is made by dissolving 60g of NaOH with specific requirements for each application.

6. Solubility and Saturation: Understanding Limitations

While NaOH is highly soluble in water, there is a limit to how much can be dissolved at a given temperature. Beyond a certain concentration, the solution becomes saturated, and any additional NaOH will remain undissolved. The solubility of NaOH increases with temperature. Understanding solubility limits is crucial to ensure that a solution is made by dissolving 60g of NaOH without exceeding the saturation point.

7. Further Research and Analysis

Further research could focus on:

Precise measurements: Determining the effect of varying the amount of water on the heat of dissolution and the resulting molarity.

Kinetic studies: Investigating the rate of dissolution of NaOH under different conditions.

pH measurements: Accurately determining the pH of solutions with different concentrations.

Spectroscopic analysis: Characterizing the solution using spectroscopic techniques to analyze ion concentrations and interactions.

8. Conclusion

Preparing a solution by dissolving 60g of NaOH is a common yet potentially hazardous procedure requiring meticulous planning and execution. Accurate measurements, careful handling, and strict adherence to safety protocols are paramount. The concentration of the resulting solution, highly dependent on the final volume, dictates its applications and requires understanding the exothermic nature of the dissolution process. Proper understanding of the chemical and physical properties of such a solution is essential for safe and effective utilization in various applications.

FAQs

1. What happens if I add water to solid NaOH instead of the other way around? Adding water to solid NaOH can cause a violent exothermic reaction, leading to splashing of the corrosive solution and potential burns. Always add the solid to the water slowly and carefully.
1. What is the best way to dispose of a NaOH solution? Never pour NaOH down the drain. Neutralize the solution with a weak acid (like acetic acid) before disposal, following local regulations.
1. How can I determine the exact concentration of my NaOH solution? Titration against a standard acid solution is the most accurate method for determining the concentration of a NaOH solution.
1. What are the health risks associated with NaOH exposure? NaOH is corrosive and can cause severe burns to skin, eyes, and respiratory tract. Inhalation can cause lung damage.
1. Can I store a NaOH solution for a long time? NaOH solutions are susceptible to carbonation from atmospheric CO₂, which can affect their concentration over time. Store in airtight containers in a cool, dry place.
1. What is the difference between molarity and normality for NaOH solutions? For NaOH, molarity and normality are numerically the same because each mole of NaOH provides one mole of OH⁻ ions.

1. Why is it important to use distilled water when preparing a NaOH solution? Using distilled water prevents the introduction of impurities that could affect the accuracy of the solution's concentration and reactivity.
1. What are some common uses of NaOH besides those mentioned? Other uses include in the production of paper, textiles, and various chemicals, as well as in food processing (though carefully controlled).
1. What safety equipment is absolutely essential when working with NaOH solutions? Eye protection (goggles), chemical-resistant gloves, a lab coat, and a well-ventilated area are all essential.

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In chemistry, a solution is defined by IUPAC as "A liquid or solid phase containing more than one substance, when for convenience one (or more) substance, which is called the solvent, is ...

SOLUTION | English meaning - Cambridge Dictionary

SOLUTION definition: 1. the answer to a problem: 2. a mixture in which one substance is dissolved in another... Learn more.

Solution - definition of solution by The Free Dictionary

A solution is a homogeneous mixture of two substances—that is, it has the same distribution of particles throughout. Technically speaking, a solution consists of a mixture of one or more ...

Solution | Definition & Examples | Britannica

solution, in chemistry, a homogenous mixture of two or more substances in relative amounts that can be varied continuously up to what is called the limit of solubility. The term solution is ...

solution noun - Definition, pictures, pronunciation and usage ...

Definition of solution noun from the Oxford Advanced Learner's Dictionary. [countable] a way of solving a problem or dealing with a difficult situation synonym answer. Attempts to find a ...

Solution - Definition, Meaning & Synonyms - Vocabulary.com

A solution is all about solving or dissolving. If you find an answer to a question, both the answer and how you got there is the solution. If you dissolve a solid into a liquid, you've created a ...

What does SOLUTION mean? - Definitions.net

In chemistry, a solution is a homogeneous mixture composed of only one phase. In such a mixture, a solute is a substance dissolved in another substance, known as a solvent. The ...

SOLUTION definition and meaning | Collins English Dictionary

A solution is a liquid or solid which is made by dissolving a solid, liquid,

or gas in the pure liquid or solid. A solution which does not dissolve any more solute is described as being supersaturated.

SOLUTION Definition & Meaning | Dictionary.com

Solution definition: the act of solving a problem, question, etc... See examples of SOLUTION used in a sentence.

ANSWER KEY - Los Angeles Mission College

1. A buffer solution is prepared by adding 0.10 L of 2.0 M acetic acid solution to 0.10 L of 1.0 M NaOH solution. a) Calculate the pH of this buffer solution. $0.10 \text{ L } 2.0 \text{ mol} \times 1 \text{ L } 2 \text{ } 3 \text{ } 2 = 0.20 \dots$

NaOH Etch of Fission Tracks in a Soda-Lime-Silica Glass

NaOH etch at 60° C has been reported for phosphate glasses³ • ... NaOH. The reflux solution was made by dissolving 12 g NaOH in 16 g water.

Assessment Chapter Test B - Ed W. Clark High School

Apr 6, 2016 · solution that contains 8.20 mol NaOH? 31. ... It is 18.0 g per 100. g of water at 60.0°C. How many grams of the substance can crystallize from a saturated solution that ...

Chapter 4: Solution Stoichiometry – Cont. - Bridgewater State ...

Example 4.5: Find the molarity of a solution that has 25.5 g KBr dissolved in 1.75 L of solution 25.5 g KBr, 1.75 L solution Molarity, M Solution:

Conceptual Plan: Relationships: Given: Find: ...

7 SOLUTIONS - The National Institute of Open Schooling ...

Example 7.4 : Calculate the normality of a solution of NaOH if 0.4 g of NaOH is dissolved in 100 ml of the solution. Solution : Mass of NaOH present in 100 mL of the solution = 0.4 g? Mass of ...

Preparing Standard Sodium Hydroxide Solution* - Iowa State ...

is calculated by dividing Molecular weight by 1, that is 40 divided by 1= 40. So the equivalent weight of NaOH is 40. To make 1 N solution, dissolve 40.00 g of sodium hydroxide in water to ...

Unit 4. Types of Chemical Reactions and Solution ...

Calculate the molarity of a solution made by dissolving 0.135 mol K₂SO₄ in enough water to form ... A 60.0 g sample of NaOH is dissolved in water, and the solution is diluted to give a final ...

Ascorbic Acid as a Reductant for Extraction of Iron-

Ascorbic acid solution was prepared by dissolving 7 g ascorbic acid in 100 mL of deionized water. A 0.1 M FerroZine solution was prepared by dissolving 0.511 g FerroZine (C. 20. H. 13. N. 4. ...

Solutions Review Guide - KEY - Garzzillo Science

What is the percent by mass of a solution made by dissolving 0.49 g of

potassium sulfate in 12.70 g of water? ... Calculate the number of moles of NaOH contained in 250mL of a 0.05M ...

Experiment 5 Chem 313 - umb.edu

for the concentration of your NaOH solution. (5 pts) 2. Calculate the mean, s e, s m, and 95% CL of the concentration of your NaOH solution. (5 pts) 3. Calculate the mean, s e, s m, and 95% ...

Acids, Alkalis and Titrations - IG Exams

2 (a) A student made a solution of sodium hydroxide by dissolving 10.0 g of solid sodium hydroxide in distilled water to make 250 cm³ of solution. (i) Calculate the amount, in moles, of ...

STANDARD OPERATING PROCEDURE

Table: Mass of NaOH required to prepare 1L of dilute solution
Molarity required Mass of solid NaOH
0.1M 4.0g 0.5M 20.0g 1M 40.0g 2M 80.0g 6M 240.0g
a 0.5M solution can be ...

1.22 Concentration of Solutions - chemrevise

Sep 1, 2016 · b) What would the mass concentration of this solution be in g dm⁻³? 1.7) What mass of hydrated magnesium chloride (MgCl₂·6H₂O) would be needed to make up 500 cm³ ...

3.343MHz - jawilliamsschool.ca

7) A solution was made by dissolving 0.837g Ba(OH)₂ in 100 ml final volume. If Ba(OH)₂ is fully broken up into its ions, what is the pOH and the pH of this solution? 8) A sodium hydroxide ...

Livingston Public Schools / LPS Homepage

Determine the molality of the solution. (3 points) 60 g 1 mol 0.3656 mol .91m 0.4 Kg Determine the mass % of in the solution. (3 points) 60 g x 100 = 13.0% 460 g solution Determine the ...

Unit 3, Lesson 04: Calorimetry: Using Q to Calculate H

Sample Calculation: The Molar Heat of Solution of NaOH in Water 1.046 g of sodium hydroxide is dissolved in 100.0 mL of water in a styrofoam cup. The initial temperature of the water before ...

A simple and universal method for making up buffer solutions ...

made up (for this example 15.60 g of the dihydrate would be required per litre of final solution), (iii) the concen- ... (15.60 g) and NaCl (58.44 g) are dissolved in about ... 1988 . concentrated ...

Laboratory Solution • Basic concepts of preparing solutions ...

Name / Formula / F.W. Concentration g/L Aluminum chloride 0.2 M 48.3 g AlCl₃ • 6H₂O 0.05 M 12.1 g 241.43 Aluminum nitrate 0.1 M 37.5 g Al(NO₃)₃ • 9H₂O 375.13 Aluminum sulfate 0.1 ...

Scanned Image - Edublogs

6.) Calculate the molarity of a solution prepared by dissolving 11.5 g of solid NaOH in enough water to make 1.50 L of solution. 23 I IV0é9 .28ÿmàe

.258 mole) -50 L 7.) Calculate the ...

Chemistry 20 - Unit 2 - pH and pOH Notes

7) A solution was made by dissolving 0.837g $\text{Ba}(\text{OH})_2$ in 100 ml final volume. If $\text{Ba}(\text{OH})_2$ is fully broken up into its ions, what is the pOH and the pH of this solution? 8) A sodium hydroxide ...

Cambridge International Examinations Cambridge ...

1 FB 1 is a solution made by dissolving an unknown mass of a mixture of ethanedioic acid, $(\text{COOH})_2$, and sodium ethanedioate, $(\text{COONa})_2$. You will carry out two titrations to find the ...

Solutions, Molarity, and Stoichiometry CHM 1311.003

What is the molarity of a solution made by dissolving 16.0 g of calcium chloride to make 250.0 mL of aqueous solution? 2. ... neutralized by 26.04 mL of 0.1024M NaOH? 5. If 3.50 g of solid ...

OpenStax Chemistry 2e 11.1: The Dissolution Process

1. Calculate the percent by mass of KBr in a saturated solution of KBr in water at 10 °C. See Figure 11.16 for useful data, and report the computed percentage to one significant digit. ...

Lecture 13 - SAMPLE PROBLEMS

(a) To find the mass of solvent we assume the % is per 100 g of solution. Take the difference in the mass of the solute and solution for the mass of peroxide. (b) Convert g of solute and ...

STOCK SOLUTION AND DILUTION - Tishk International ...

It is the number of grams of solute dissolved in 100 mL of solution. o For example, 3% of NaOH, means 3 grams of NaOH is dissolved in 100 mL of the solution. o Example: Prepare 50 mL of ...

CANTT ACADEMY

Solution Molar mass of NaOH A solution of NaOH has concentration 1.2M. Calculate the mass of NaOH in g/dm³ in this solution. Molarity = 1.2 M Mass of NaOH in g/dm³ = ? Volume of ...

AP Chemistry Sample Student Responses and Scoring ...

Nitrogen monoxide, $\text{NO}(\text{g})$, can undergo further reactions to produce acids, such as HNO_2 , a weak acid with a K_a of 4.0×10^{-4} and a $\text{p}K_a$ of 3.40. (c) A student is asked to make a ...

FORM 3 CHEMISTRY (PRACTICAL) - FREE KCSE PAST PAPERS

20 to form 500 cm³ solution. - Sodium hydroxide solution . P . made by dissolving 0.16 g of NaOH pellets to form 200 cm³. 3. You are required to: i) Determine the concentration of ...

STOCK SOLUTION RECIPES: Tris-HCl Buffer - Drexel ...

The 10% sodium deoxycholate stock solution (5 g into 50 ml) must be protected from light. The 100 mM EDTA stock solution is made with 1.86 g into 40 ml H₂O and then add NaOH to ...

DISSOLVED STATE AND VISCOSITY PROPERTIES OF ...

($\lambda = 0.15406$ nm), 40 kV, 100 mA, $2\theta = 5-60^\circ$, scan rate $10^\circ/\text{min}$, reflection mode. Viscosity measurement To compare the viscosity properties of the cellulose solution prepared by ...

Chemistry 101 Chapter 4 - mymission.lamission.edu

Determine the molarity of a solution prepared by dissolving 32.0 g of NaOH in 185 mL of solution. 4. How many mL of 0.150 M AgNO₃ ... How much water must be added to 60.0 mL of 0.150M ...

CHEMFILE MINI-GUIDE TO PROBLEM SOLVING CHAPTER 14 ...

What is the molarity of a salt solution made by dissolving 280.0 mg of NaCl in 2.00 mL of water? Assume the final volume is the same as the volume of the water. ans: 2.40 M ... 40.00 g ...

Skills Worksheet Problem Solving - PC\|MAC

What is the percentage by mass of a solution made by dissolving 0.49 g of potassium sulfate in 12.70 g of water? Solution ... 1 mol NaOH 40.00 g NaOH 0.7500 L solution L solution 6.00 mol ...

Solutions to Concentration problems - xaktly.com

1. Calculate the concentration of a solution prepared by dissolving 5.68 g of NaOH in enough water to make 400 mL of solution. 5.68 g NaOH 1 (1 mole NaOH 40.0 g) = 0.142 moles NaCl ...

Calculating pH, pOH, and [OH⁻] - Mr. Arthur's Science Page

A solution is made by dissolving 0.45 mol of sodium hydroxide, NaOH(s), in enough water to make 3.75 L of solution. Determine the pH and pOH of this solution at 25 °C. ... A solution at ...

1. 2. 3. 4. - GaryTurnerScience

Calculate the final concentration of a solution that is made by dissolving 14.8 g of solid sodium hydroxide in 600.0 mL of solution. 2. If I add water to 100 mL of a 0.15 M NaOH solution until ...

FA 1 FA 3 FA 2 - XtremePapers

1 You will determine the concentration of a solution of hydrochloric acid by diluting it and then titrating the diluted solution against an alkali. HCl (aq) + NaOH(aq) → NaCl (aq) + H₂O(l) FA 1 ...

RODT INMAIN - Cayman Chem

A stock solution may be made by dissolving the nalidixic acid in the solvent of choice, which should be purged with an inert gas. ... solubility of nalidixic acid in 0.5 M NaOH is ...

Section 8.3 Concentrations of Solutions Solutions for Practice ...

Determine the molar concentration of each saline solution. a. 0.60 mol NaCl(s) dissolved in 0.40 L of solution ... What volume of 0.25 mol/L solution can be made using 14 g of sodium ... You ...

Solutions. Calculation of solution concentration (percent ...

Solution . A . solution. is a homogeneous mixture of a . solute. and a . solvent. Solutions can be formed in any state of matter; that is they may be solid, liquid, or gas. A solution is prepared by ...

Concentration of solutions

will be needed to make the solution? answer: 7.16 g H₂O 4. What mass of lithium nitrate would have to be dissolved in 30 g of water in order to make an 18 % solution? answer: 6.59 g LiNO ...

Saponification and the Making of Soap - An Example of Basic ...

in base (e.g., NaOH) yields glycerol (a carbohydrate) and the sodium salts of the fatty acids. ... Dissolve about 1 g of your soap in 50-60 mL of boiling distilled water (this is the Soap ...

mccord (pmccord) – HW07 Buﬀers & Titration – mccord – ...

A buﬀer solution is made by dissolving 0.45 moles of a weak acid (HA) and 0.23 moles of KOH into 750 mL of solution. What is the pH of this buﬀer? ... 4.0.2 mol HBr and 0.1 mol NaOH ...

physical properties of solution - MEDICAL CLUB

)س(Which one of the following solution have hair osmotic pressure: A. 0.2 molar NaI . 0.2 molar. 6H12O6 . 0.2 molar. FeI₃ D. 0.2 molar. Na₂SO₄
□Permeable membrane that lets only solvent ...

Buffer Solutions: Are made by combining a weak acid and a ...

1.) Calculate the pH of a solution that is made by dissolving 15.223 g of benzoic acid (C₆H₅CO₂H, K_a = 6.4 × 10⁻⁵) and 14.889 g of sodium benzoate (C₆H₅CO₂Na) in enough ...

Easy Level - pps.kaznu.kz

0.25 M NaOH. 17. A solution is made by dissolving 50 g of Na₂CO₃ in 300 mL of water. What is its concentration? 18. Find the molarity of a solution when 75 g of CaCl₂ is dissolved in 500 mL of ...

Easy Level - pps.kaznu.kz

0.25 M NaOH. 17. A solution is made by dissolving 50 g of Na₂CO₃ in 300 mL of water. What is its concentration? 18. Find the molarity of a solution when 75 g of CaCl₂ is dissolved in 500 mL of ...

OH - PREVOR

Dynamic viscosity depending on NaOH concentration {NaOH} (%w/w) Dynamic viscosity (cP - centipoise) 20 30 0 10 10 20 30 40 50 60 40 50 60 70 80 90
Figure 2 : Evolution of the ...

0 = Oxygen atoms Hydrogen bonds - oakparkusd.org

1. Calculate the molarity of 1.60L of a solution containing 0.05 moles of dissolved KBr. 0.031M 23. If .5g of blood are added to 10.0 kg of water what is the concentration in PPM? (1 kg = 1g) ...

Buffers and stock solutions - Abcam

The 10% sodium deoxycholate stock solution (5 g into 50 ml) must be protected from light. The 100 mM EDTA stock solution is made with 1.86 g into 40 ml H₂O and then add NaOH to ...

A Solution Is Made By Dissolving 60 G Of Naoh

A Solution Is Made By Dissolving 60 G Of Naoh

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