Understanding Concepts

4. Household bleach is an aqueous solution that contains 5.25 g of sodium hypochlorite, $NaOCl_{(aq)}$, per 100.0 mL of solution. What is the molar concentration of sodium hypochlorite in bleach?

5. A brine solution that is used in pickling contains 235 g of pure sodium chloride, $NaCl_{(s)}$, dissolved in 3.00 L of solution. What is the molar concentration of the sodium chloride?

6. A stock solution of hydrochloric acid, $HCl_{(aq)}$, is made by dissolving 7.66 g of hydrogen chloride, $HCl_{(g)}$, in enough distilled water to produce 1.50 L of solution. Calculate the concentration of aqueous hydrochloric acid in this stock solution.

7. Potassium dichromate solution, $K_2Cr_2O_{7(aq)}$, is used to analyze the alcohol content of wine. A lab technician dissolves 102.9 g of solid potassium dichromate in enough distilled water to produce 1.75 L of aqueous potassium dichromate. Determine the concentration of aqueous potassium dichromate in this solution.

Understanding Concepts

8. What amount of silver nitrate, $AgNO_{3(aq)}$, is in 50.0 mL of a 0.570-mol/L solution?

9. The molar concentration of commercial hydrochloric acid, $HCl_{(aq)}$, is 12.4 mol/L. What amount of hydrogen chloride is in 1.50 L of commercial hydrochloric acid?

10. The hemoglobin in red blood cells carries oxygen to body tissues. What amount of hemoglobin is in 25.0 mL of a hemoglobin solution with a concentration of 1.90×10^{-3} mol/L?

11. A lab technician adds 35.8 mL of a 0.0176-mol/L solution of potassium hydroxide, $KOH_{(aq)}$, to a reaction mixture. What amount of potassium hydroxide does the technician add to the mixture?

Understanding Concepts

12. Seawater contains approximately 0.055 mol/L of magnesium chloride, $MgCl_{2(aq)}$. What volume of seawater contains 4.1 mol of magnesium chloride?

13. What volume of 7.6-mol/L hydrochloric acid, $HCl_{(aq)}$, must be poured into a flask to obtain 0.050 mol of hydrochloric acid?

14. A lab technician must add 1.25 mol of iron chloride, $FeCl_{3(aq)}$, to a flask using a 6.00-mol/L iron chloride stock solution. How many millilitres of the stock solution must the technician pour into the flask?

15. How many litres of a 0.0020-mol/L sodium dichromate solution, $Na_2Cr_2O_{7(aq)}$, contains 5.0 mol of sodium dichromate?

Understanding Concepts

16. Formaldehyde, $CH_2O_{(g)}$, is an indoor air pollutant that comes from synthetic materials and cigarette smoke. A dangerous level of formaldehyde is 3.2 mg in a 500.0-L sample of air. Express this concentration of formaldehyde in parts per million.

17. Copper is an element that is required in very small concentrations in the bodies of all animals. What is the concentration of copper, in parts per million, if 1.0 L of drinking water contains 3.0×10^{-5} g of copper?

18. Dissolved oxygen in natural water is an important measure of the health of the ecosystem. In a chemical analysis of the water from a pond, 350 mL of water is found to contain 1.8 mg of dissolved carbon dioxide. What is the concentration of dissolved carbon dioxide, in parts per million?

Understanding Concepts

19. Calculate the final concentration of a glucose solution if 240 mL of 15% W/V glucose is diluted with water to 300.0 mL.

20. A laboratory technician needs to make 500.0 mL of a 0.100-mol/L sulfuric acid solution. What volume of 16.0-mol/L sulfuric acid does the technician need to use?

21. How many millilitres of a 14.8-mol/L ammonia solution, $NH_{3(aq)}$, do you need in order to make 100.0 mL of 1.00-mol/L ammonia solution?

22. Calculate the final concentration of a 0.400 mol/L barium chloride solution, $BaCl_{2(aq)}$, when 125 mL of the solution is diluted with distilled water to a final volume of 500.0 mL.