Molarity & Empirical Formula Problems

1. You prepare a solution by dissolving 5.23 grams of Iron II nitrate in enough water to make 100.0 cm^3 of solution. What is the concentration of the solution?

2. What is the molarity of a solution formed by dissolving 8.55 grams of ammonium iodide to a total volume of 150 ml total solution?

3. What is the concentration of a solution formed by mixing 9.94 grams of cobalt II sulfate in enough water to make 250 cm^3 solution.

4. 44.3 grams of $Pb(ClO_4)_2$ is dissolved in sufficient water to make 250 cm^3 solution. What is the concentration of the resulting solution?

5. How many grams of solute are in 1.00 liter of a 3.00 M nickel II chloride solution?

6. How many chlorine atoms are present in 250.0 cm^3 of a 0.500 M $CoCl_2$ solution?

7. How many moles of silver fluoride are contained in 500.0 cm^3 of 1.5 M AgF solution.

8. How many milliliters of 0.002 M $Cd(IO_3)_2$ solution are needed to provide 250 grams of $Cd(IO_3)_2$?

9. Calculate the empirical formula of a compound that contains 1.67 g of cerium and 4.54 g of iodine.

10. 2-methylpropene is a compound used to make synthetic rubber. A sample of 2-methylpropene contains 0.556 g carbon and 0.0933 grams hydrogen. Determine its empirical formula.

11. Benzoic acid is a compound used as a food preservative. The compound contains 68.8% carbon, 4.95% hydrogen, and 26.2 % oxygen by mass. What is its empirical formula?

12. Freons are gaseous compounds used in refrigeration. A particular Freon contains 9.93% carbon, 58.6% chlorine, and 31.4% fluorine by mass. What is the empirical formula of this Freon?