

Which of the following statements is(are) true? For the false statements, correct them.

- a) A concentrated solution in water will always contain a strong or weak electrolyte.*
- b) A strong electrolyte will break up into ions when dissolved in water.*
- c) An acid is a strong electrolyte.*
- d) All ionic compounds are strong electrolytes in water.*



Show how each of the following strong electrolytes “breaks up” into its component ions upon dissolving in water by drawing molecular-level pictures.

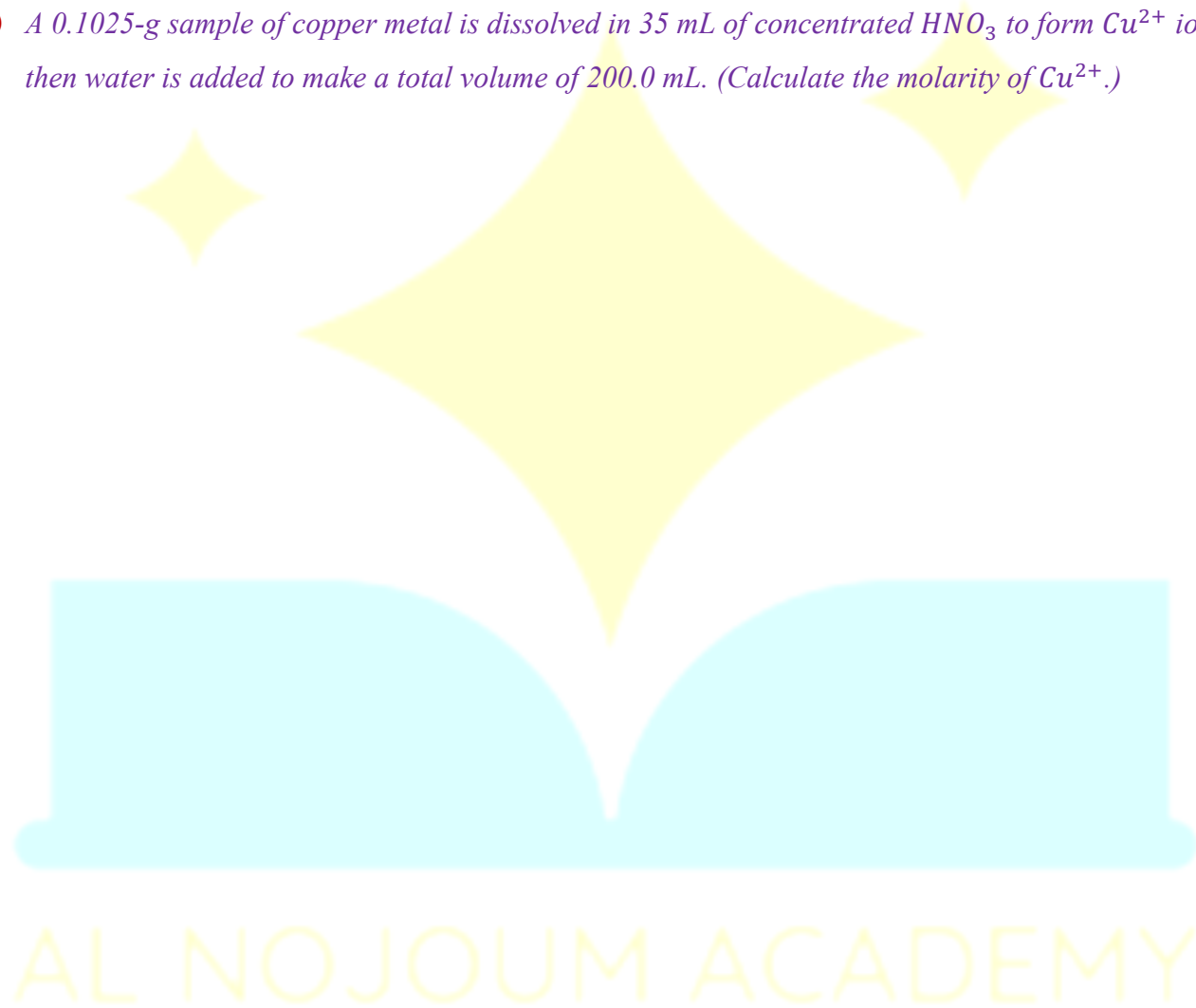
- a) NaBr
- b) MgCl_2
- c) $\text{Al}(\text{NO}_3)_3$
- d) $(\text{NH}_4)_2\text{SO}_4$
- e) NaOH
- f) FeSO_4
- g) KMnO_4
- h) HClO_4
- i) $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$ (ammonium acetate)



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Calculate the molarity of each of these solutions.

- a) A 5.623-g sample of NaHCO_3 is dissolved in enough water to make 250.0 mL of solution.*
- b) A 184.6-mg sample of $\text{K}_2\text{Cr}_2\text{O}_7$ is dissolved in enough water to make 500.0 mL of solution.*
- c) A 0.1025-g sample of copper metal is dissolved in 35 mL of concentrated HNO_3 to form Cu^{2+} ions and then water is added to make a total volume of 200.0 mL. (Calculate the molarity of Cu^{2+} .)*

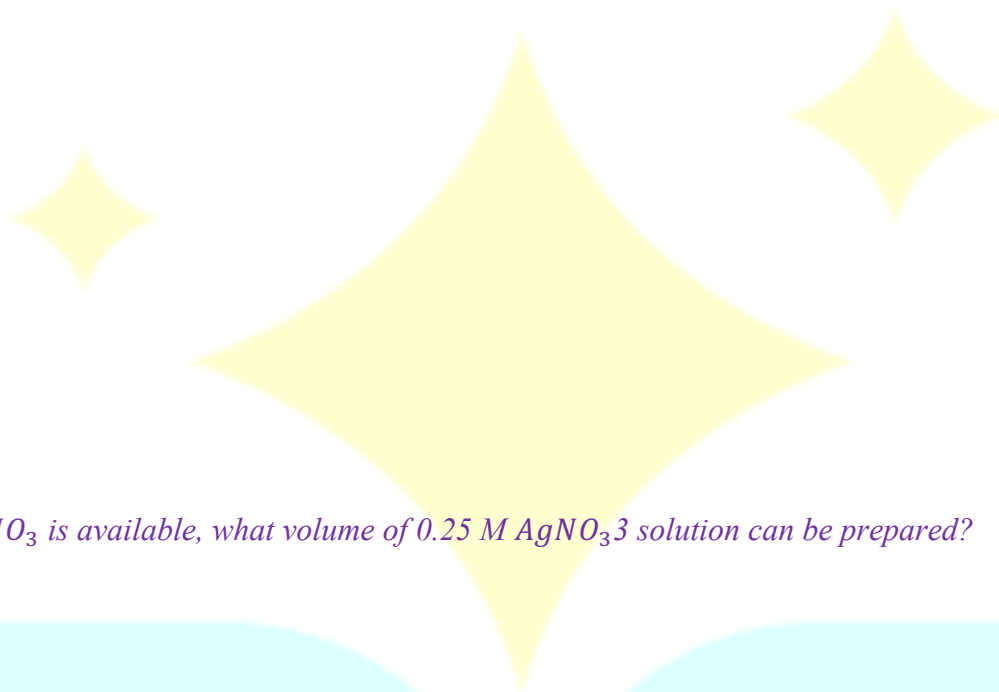


31. Calculate the concentration of all ions present in each of the following solutions of strong electrolytes.

- a) 0.100 mole of $\text{Ca}(\text{NO}_3)_2$ in 100.0 mL of solution*
- b) 2.5 moles of Na_2SO_4 in 1.25 L of solution*
- c) 5.00 g of NH_4Cl in 500.0 mL of solution*
- d) 1.00 g K_3PO_4 in 250.0 mL of solution*



What mass of NaOH is contained in 250.0 mL of a 0.400 M sodium hydroxide solution?



If 10. g of AgNO_3 is available, what volume of 0.25 M AgNO_3 solution can be prepared?

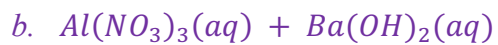


43. A solution is prepared by dissolving 10.8g ammonium sulphate in enough water to make 100.0 mL of stock solution. A 10.00-mL sample of this stock solution is added to 50.00 mL of water. Calculate the concentration of ammonium ions and sulfate ions in the final solution.



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When the following solutions are mixed together, what precipitate (if any) will form?



53. For the reactions in Exercise 51, write the balanced formula equation, complete ionic equation, and net ionic equation. If no precipitate forms, write "No reaction."



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61. What mass of Na_2CrO_4 is required to precipitate all of the silver ions from 75.0 mL of a 0.100-M solution of AgNO_3 ?



65. What mass of solid AgBr is produced when 100.0 mL of 0.150 M AgNO_3 is added to 20.0 mL of 1.00 M NaBr ?

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67. A 100.0-mL aliquot of 0.200 M aqueous potassium hydroxide is mixed with 100.0 mL of 0.200 M aqueous magnesium nitrate.

- a) Write a balanced chemical equation for any reaction that occurs.
- b) What precipitate forms?
- c) What mass of precipitate is produced?
- d) Calculate the concentration of each ion remaining in solution after precipitation is complete.

79. A 25.00-mL sample of hydrochloric acid solution requires 24.16 mL of 0.106 M sodium hydroxide for complete neutralization. What is the concentration of the original hydrochloric acid solution?

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