

CHEMISTRY 101 REVIEW

1. How much water must be added to 50.0 mL of a 12M stock solution of HNO₃ to obtain a 0.100 M HNO₃ solution?

2. An iceberg has a volume of 7655 cubic feet. What is the mass of the ice (in kg) composing the iceberg at 0°C? (density of ice at 0°C = 0.917 g/cm³)

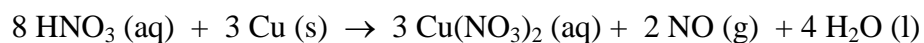
3. The density of a 20.0% solution of ethylene glycol (C₂H₆O₂) solution in water is 1.03 g/mL. What is the molarity of this solution?

4. Determine the oxidation number of each underlined element in the substances below:
 - a) ClO₃⁻ _____
 - b) HC₂H₃O₂ _____
 - c) Cr₂O₃ _____
 - d) H₃PO₄ _____

5. Write molecular and net ionic equations for each of the following reactions:
- Aqueous solutions of copper (II) nitrate and sodium hydroxide.

 - Aqueous solutions of acetic acid and calcium hydroxide.
6. What mass of lead (II) sulfate can be formed from reaction of 25.0 mL of 0.100 M sodium sulfate and 40.0 mL of 0.200 M lead (II) nitrate solutions?
7. A 0.125-g sample of a monoprotic acid of unknown molar mass is dissolved in water and titrated with 0.1003M NaOH. The equivalence point is reached after adding 20.77 mL of base. What is the molar mass of the unknown acid?

8. What is the molarity of a solution obtained by mixing 50.0 mL of 2.25 M HCl solution with 160.0 mL of 1.25 M HCl solution?
9. A solution is made by mixing 175 mL of 0.100 M K_3PO_4 with 27 mL of 0.200 M KCl. Assuming that the volumes are additive, determine the identity of the ions present in the final solution, and their respective molarities.
10. What volume (in L) of NO gas measured at STP can be produced from 50.0 mL of 6.0 M HNO_3 solution and an excess of Cu metal according to the following reaction?



ANSWERS:

1) 5950 mL

2) 1.99×10^5 kg

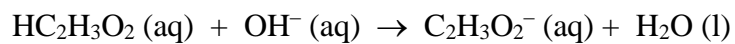
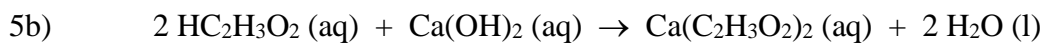
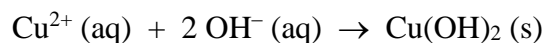
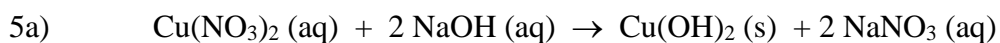
3) 3.32 M

4) a) Cl = +5

b) C = 0

c) Cr = +3

d) P = +5



6) 0.758 g

7) 60.0 g/mol

8) 1.49 M

9) $[\text{K}^+] = 0.29 \text{ M}$

$[\text{Cl}^-] = 0.027 \text{ M}$

$[\text{PO}_4^{3-}] = 0.0866 \text{ M}$

10) 1.7 L