

AP QUIZ 01AE: Empirical Formula and Gravimetric & Volumetric Analysis

Name: _____

Question 1

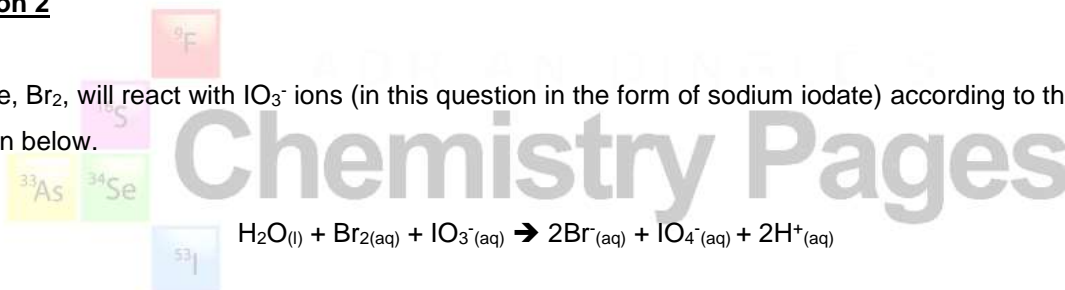
- (a) Calculate the empirical formula of a compound that has the following composition by mass. (2)

29.0% Na, 40.5% S, and the remainder being oxygen

- (b) If the molecular mass of the compound in (a) is found to be 158 g mol^{-1} , what is the molecular formula of the compound? (2)

Question 2

Bromine, Br_2 , will react with IO_3^- ions (in this question in the form of sodium iodate) according to the equation below.



(Sodium ions are spectator ions, and are omitted from the equation).

A solution of sodium iodate (molar mass = $197.89 \text{ g mol}^{-1}$) is made by adding 5.60 g of the solid to a 250 mL volumetric flask, and making up to the mark with distilled water. 25.0 mL portions of this solution are pipetted into an Erlenmeyer flask, and are titrated against a solution of bromine, with an average of 14.3 mL of the bromine solution being required for complete reaction. Calculate the concentration, in mol L^{-1} , of the bromine solution. (4)

Question 3

An *impure* sample of sodium chloride (NaCl) with a mass of 0.541 g, was dissolved in water, and then treated with an excess of silver nitrate solution. After filtering, washing and drying, 0.753 g of a precipitate was recovered.

- (a) What is chemical name and formula of the precipitate? (2)

- (b) Calculate the number of moles of the precipitate formed. (1)

- (b) Calculate the percentage of NaCl in the original sample. (4)

