EDO UNIVERSITY, IYAMHO, EDO STATE

FACULTY OF SCIENCE, DEPARTMENT OF CHEMISTRY

SECOND SEMESTER EXAMINATION, 2016/2017 SESSION

COURSE TITLE: INTRODUCTORY CHEMISTRY PRACTICAL II

COURSE CODE: CHM 124

INSTRUCTION: *ANSWER ALL QUESTIONS*   TIME ALLOWED: 3 HOURS

1. You are provided with an unknown sample. Following the procedure for melting point determination, determine the melting point of the compound and identify the compound given accordingly using the reference standards provided.

Procedure:

i.   Introduce a small quantity of the sample into a sealed capillary tube through the open end.

ii.   Attach the capillary tube to the side of a thermometer by means of a thin rubber band such that its bottom end lies along the side of the thermometer bulb.

iii.   Clamp the thermometer with its attached capillary tube so that the bulb and the sample is completely immersed in the paraffin bath.

iv.   The rubber band should not touch the oil; neither should the thermometer bulb touch the sides or the bottom of the paraffin beaker.

Reference standards: Urea ($132\ ^{o}C$), Naphthalene ($80\ ^{o}C$), Benzoic acid ($122\ ^{o}C$), Acetamide($133\ ^{o}C$), Toluic acid ($111\ ^{o}C$) , succinimide($125\ ^{o}C$), Benzylic acid ($150\ ^{o}C$)

(a). What is the melting point of the sample given?

(b). Using the reference standards above, identify the sample provided

(c). If a substance shows a wide range of melting point, what does it signify?

(d). Why is melting point determination necessary in chemical analysis?

(2a). What is the significance of Lassaignes sodium fusion test?

(2b). Using Lassaignes sodium fusion test, outline the procedure for qualitative determination of chlorine

(2c). Give a chemical test to differentiate between the following pairs of compounds

   (i). Primary alkanol and tertiary alkanol. (ii) aldehydes and ketones (iii) ethane and ethene

(2c). The reaction for preparation of soap from palm kernel oil (PKO) is represented in the equation below:
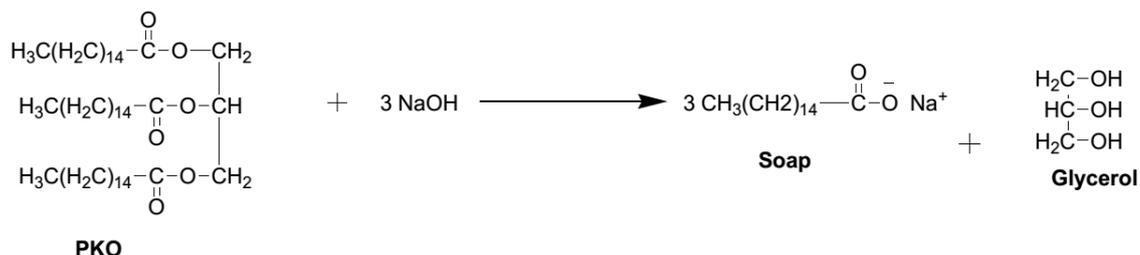
In the preparation of the soap above, a student dissolved 5 g of NaOH in 25mL water and added 10 mL palm kernel oil (density: $0.997 g/cm^{3}$). The mixture was heated and boiled with 20 mL of water, followed by addition of NaCl to the soap solution. At the end of the experiment, the student obtained 3.5g of soap.

i.   Which of the reactants is the limiting reagent?

ii.   Calculate theoretical yield of the soap?

iii.   Calculate % yield of the soap?

iv.   Differentiate between hard and soft soap?

v.   What is the function of NaCl in the preparation of soap?
      {C=12, H= 1, O= 16, Na = 23}