

Name.....U0025/ Sign

UACE mock Examinations

Chemistry P525/3

Practical Examination

Time 9-12.15pm. Time allowed: 3hours 15 minutes

Q1a You are provided with FA2 which is solution made by dissolving 24.8g sodium thiosulphate, $\text{Na}_2\text{S}_2\text{O}_3 \cdot x\text{H}_2\text{O}$ in every dm^3 of solution. You are required to determine the value of x (water of crystallisation) in FA2.

You are required to prepare solution FA1 by mixing 3.1g of solid iodine with 3.9g of solid potassium iodide in a beaker, stir well and add drops of water, continue stirring then add 50cm^3 of more water to make a solution. Transfer the solution to a 250cm^3 volumetric flask and make the solution to the 250cm^3 mark with water. Shake well to ensure uniformity, label it FA1.

Determining value of x in FA2

Mass of container/g	
Mass of container + iodine/g	
Mass of container after transferring iodine/g	
Mass of iodine transferred/g	

Mass of container/g	
Mass of container + potassium iodide /g	
Mass of container after transferring KI/g	
Mass of potassium iodide transferred/g	

Pipette 25.0 cm³ of FA2 to a clean flask, add two drops of starch indicator. Titrate the mixture with FA1 until the mixture just turns faintly blue in colour. Record your results in the table. Repeat the experiment to obtain consistent results.

Pipette = cm³

<i>Run</i>	1	2	3
<i>Final reading/cm³</i>			
<i>Initial reading/cm³</i>			
<i>Volume of FA1 used/cm³</i>			

List the volumes of FA1 to be used to calculate the average ,,
..... cm³.

Calculate;

i) Mean volume of FA1 used.

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ii) Molarity of FA1 (I= 127)

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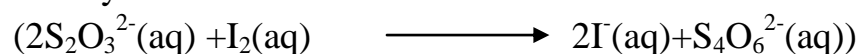
iii) Moles of FA2 pipetted.

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iv) Molarity of FA2.



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v) Value of x. (Na =23, S=32, O=16, H=1)

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Q1b You are provided FA3 which is solution made by dissolving 2.45g l^{-1} of chlorate of formula XClO_3 dissolved in 0.5M sulphuric acid as well as FA2 which you standardized in 1a) above.

Pipette 25.0 cm^3 of FA2 to a clean flask; add 5cm^3 of potassium iodide solution followed by two drops of starch indicator. Titrate the mixture with FA3 until the mixture just turns faintly blue in colour. Record your results in the table. Repeat the experiment to obtain consistent results.

Pipette = cm^3

Run	1	2	3
Final reading/ cm^3			
Initial reading/ cm^3			
Volume of FA3 used/ cm^3			

List the volumes of FA3 to be used to calculate the average,, cm^3

Calculate;

i) Mean volume of FA3 used.

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ii) Moles of FA2 used.

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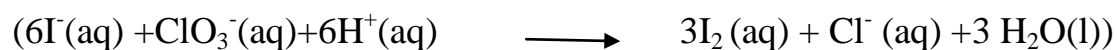
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iii) Moles of Iodine liberated in mixture.

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iv) Moles of FA3 in pipetted volume.



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Q2. You are provided with substance R which contains two cations and two anions. Perform the tests given below on R, record your observations and deductions in the space provided. You must **identify** fully gas(es) evolved immediately, if any.

Test	Observation	Deduction
1. Place little of R in a dry tube and heat strong until there is no further change.		
2. To two spatula ends full of R add drops of concentrated sulphuric acid, then warm the mixture.		
3. To little of R in a test tube add dil. NaOH drop by drop until in excess, shake well, then filter. Keep residue and filtrate. To the filtrate add dil. HNO_3 solution drop by drop until in excess. Divide the filtrate in six parts.		
a) To the first add dil. NaOH drop by drop until in excess. The add limus solution.		
b) To the second, add dil. NH_3 drop by drop until in excess.		

c) To the third portion add dil. Na_2CO_3 solution drop by drop until in excess.		
d) To the add dil. HCl drop by drop until in excess.		
e) To the fifth, drops of lead (II) nitrate solution. Heat to boiling.		
f) To the sixth part add drops of silver nitrate solution, then add dil. NH_3 drop by drop until in excess.		
f) Use the sixth part to perform test of your choice to confirm another anion in filtrate.		
4) Transfer the residue to a clean tube. Wash with water, then add dil. HCl drop by drop until in excess. Divide the solution in three portions.		
i) To the 1 st add dil. NaOH drop by drop until in excess.		

ii) To the 2nd portion, add dil. NH_3 drop by drop until in excess .		
iii) To the add a spatula end full of red lead oxide followed by drops of conc HNO_3 .		

Cations = 1. 2 .

Anions = 1. 2.

Q3 You are provided with substance S. Perform the tests given on S. Record your observations and deductions in the table.

Test	Observation	Deduction
1) Put little of S on spatula end and heat in a flame.		
2) To little of S in a test tube, add water and shake. Then add litmus.		
3) To little of S, add drops of bromine water.		
4) To little of S,		

add dilute FeCl_3 solution drop by drop.		
5) To little of S in a tube add drop of potassium chromate solution then dil H_2SO_4 and heat to boiling.		
6) To little of S in a tube add drops of 2,4- dinitropheny l hydrazine solution then dil. H_2SO_4		
7) To little of S add drops of 2M NaOH followed by iodine solution drop by drop until in excess. Warm the mixture.		

Comment on nature of S.....

End.....Success