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CHEMISTRY	Signature: Personal No:
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Paper 4	
29th July 2022	KWGSA
2 Hours	v <sub>a</sub> € v <sub>a</sub>



## KAMPALA WAKISO GIANT SCHOOLS' ASSOCIATION (KWGSA)

National Joint Mock Examination 2022

# **Uganda Certificate of Education**

CHEMISTRY PRACTICAL

Paper 4

2 Hours

## INSTRUCTIONS TO CANDIDATES

- This paper consists of two sections
- Attempt both questions in the spaces provided
- Silent non-programmable calculators mat be used
- The candidate is not supposed to use any reference books like text books during the examination

## For Examiner's use only

	•
Question	Marks
1	
2	
Total	

- 1. You have been provided with the following
  - FA<sub>1</sub> which is a solution of 1.0M hydrochloric acid.

FA<sub>2</sub> is a solution of 0.2M sodium thiosulphate pentahydrated (Na<sub>2</sub>S<sub>2</sub>O<sub>3</sub>.5H<sub>2</sub>O)

FA<sub>3</sub> is a solution containing a compound Q.

You are required to determine the effect of compound Q on the rate of reaction between  $FA_1$  and  $FA_2$ .  $FA_1$  reacts with  $FA_2$  according to the equation below;

$$S_2O_3^{2-}(aq) + 2H^+(aq) \rightarrow S(s) + H_2O(l) + SO_2(g)$$

### **Procedure**

- (i) Make a cross **X** on a white sheet of paper using a blue of black pen
- (ii) Measure 50.0cm<sup>3</sup> of **FA**<sub>2</sub> into a conical flask using a measuring cylinder.
- (iii) Place the conical flask on the cross and add 10.0cm<sup>3</sup> of **FA**<sub>1</sub> from the burette and simultaneously start the stop clock.
- (iv) Shake the mixture thoroughly for the solutions to mix while looking at the cross through the solution from above.
- (v) Stop the clock when the cross on the paper just becomes invisible.
- (vi) Record your results in the table below.
- (vii) Repeat the procedure for volumes of  $FA_2 = 40$ , 30, 20 and  $10 \text{cm}^3$  and in each case record your results in the table.

#### **Results**

Volume of FA <sub>2</sub> (cm <sup>3</sup> )	50	40	30	20	10
Volume of <b>FA</b> <sub>3</sub> added (cm <sup>3</sup> )	0	10	20	30	40
Time $t$ , (s)					
$\frac{1}{t}(S^{-1})$					

(05 marks)

(b)	Plot a graph of $\frac{1}{t}$ (along the vertical axis) against the volume of <b>F</b>												
	the horizontal axis)	(08 marks)											
(c)	Calculate the slope of the graph.	(08 marks) (03 marks)											

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(d)	Lxpi	ani the variation of fat	e of reaction with volume	of $\mathbf{FA}_2$ (02 marks
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(a)		State the feeter hair	a investigated	
(e)	(1)	State the factor bein		(01 mark
	ii)	State other <b>two</b> fact	ors that affect the rate of re	action. (02 marks
You	are pr	ovided with substance	e V which contains two c	ations and <b>one</b> anion
	_		V to identify them. Identif	
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ana 1	record :	your observations in th	ne table below.	(25 marks
ina 1	Test		Observation	(25 marks
and i	Test Heat	a spatula endful of <b>V</b>	I	,
	Test Heat in a h	a spatula endful of <b>V</b> ard test tube strongly	I	,
	Test Heat in a h until	a spatula endful of V ard test tube strongly there is no further	I	,
	Test Heat in a h until chang	a spatula endful of V ard test tube strongly there is no further ge	I	,
	Test Heat in a h until change	a spatula endful of V ard test tube strongly there is no further ge	I	,
a)	Test Heat in a h until chang  Disso of V	a spatula endful of V ard test tube strongly there is no further ge  lve a spatula end ful in 5cm³ of distilled	I	,
a)	Test Heat in a h until change Disso of V water	a spatula endful of V ard test tube strongly there is no further ge  live a spatula end ful in 5cm³ of distilled and shake	I	,
a)	Test Heat in a h until chang  Disso of V water vigor	a spatula endful of V ard test tube strongly there is no further ge  lve a spatula end ful in 5cm³ of distilled	I	,
a)	Test Heat in a h until chang  Disso of V water vigore hydro	a spatula endful of V ard test tube strongly there is no further ge  live a spatula end ful in 5cm³ of distilled and shake ously. Add sodium	I	,
a)	Test Heat in a h until change  Disso of V water vigore hydro wise Keep	a spatula endful of V and test tube strongly there is no further ge  live a spatula end ful in 5cm³ of distilled and shake ously. Add sodium exide solution drop until in excess. Filter both the filtrate and	I	,
a) b)	Test Heat in a h until chang  Disso of V water vigore hydro wise Keep the re	a spatula endful of V ard test tube strongly there is no further ge  lve a spatula end ful in 5cm³ of distilled and shake ously. Add sodium exide solution drop until in excess. Filter both the filtrate and sidue.	I	,
a)	Test Heat in a h until change Disso of V water vigore hydro wise Keep the re Wash	a spatula endful of V ard test tube strongly there is no further ge  live a spatula end ful in 5cm³ of distilled and shake ously. Add sodium exide solution drop until in excess. Filter both the filtrate and sidue.  the residue with	I	,
a) b)	Test Heat in a h until chang  Disso of V water vigore hydro wise Keep the re Wash Sodiu	a spatula endful of V ard test tube strongly there is no further ge  lve a spatula end ful in 5cm³ of distilled and shake ously. Add sodium exide solution drop until in excess. Filter both the filtrate and sidue.  the residue with am hydroxide and	I	,
a) b)	Test Heat in a h until chang  Disso of V water vigore hydro wise Keep the re Wash Sodiu add acid	a spatula endful of V ard test tube strongly there is no further ge  live a spatula end ful in 5cm³ of distilled and shake ously. Add sodium exide solution drop until in excess. Filter both the filtrate and sidue.  the residue with	I	,

three portions.

i)	To the first portion, add sodium hydroxide solution drop wise until in excess	
ii)	To the second portion, add 1cm of magnesium Ribbons and leave it to stand for one minute.	
iii)	To the third portion, add ammonia solution drop wise until in excess.	
d)	To 4 cm <sup>3</sup> of the filtrate in a clean test tube, add dilute nitric acid until it becomes just acidic. Divide the solution into <b>five</b> portions.	
i)	To the first part, add sodium hydroxide drop wise until in excess.	
ii)	To the second portion, add 5 drops of sulphuric acid and leave it to stand.	
iii)	Use the third portion to carryout a test of your choice to identify the cation in the filtrate.	

iv)	To the forth portion, add 3 drops of Lead (II) nitrate solution		
v)	To the fifth portion, add 3		
	drops of barium nitrate		
	solution followed by		
	dilute nitric acid		
	rify the; ons in <b>V</b> :	and	
Anio	ns in <b>V</b> :		