

2020

CHEMISTRY — HONOURS — PRACTICAL

Paper : DSE-B-1P

(Inorganic Materials of Industrial Importance)

Full Marks : 30

*The figures in the margin indicate full marks.*1. For the estimation of the quantity of CaCO_3 and MgCO_3 present separately in a given dolomite sample in g :

(a) Write down the principle of dissolution and estimation mentioning all the equations involved and derive the working formula. 15

(b) Using the following data calculate the strength of $\sim(\text{M}/50)$ EDTA solution :(i) 1.1451 g of Zn-acetate dihydrate has been accurately weighed, transferred to a 250 mL volumetric flask and volume is made up with distilled water in presence of NH_4Cl .(ii) Standardization of $\sim(\text{M}/50)$ EDTA by standard Zn-acetate 2½+2½

No. of titrations	Volume of standard Zn-acetate taken (mL)	Burette reading of EDTA solution (mL)			
		Initial	Final	Difference	Most frequent reading
1	25	0	26.3	26.3	26.3
2	25	0	26.4	26.4	
3	25	0	26.3	26.3	

(c) 0.7678 g of the Dolomite sample has been weighed accurately and after dissolution step, the volume is made up to 250 mL in a volumetric flask.

Using the above data, calculate separately the amount of CaCO_3 and MgCO_3 present in the given Dolomite sample in g by using the following specimen results. 5+5(i) Table for estimation of Ca^{II} and Mg^{II} :

No. of titrations	Volume of stock solution taken (mL)	Burette reading of EDTA solution (mL)			
		Initial	Final	Difference	Most frequent reading
1	25	0	35.5	35.5	35.5
2	25	0	35.5	35.5	
3	25	0	35.6	35.6	

Please Turn Over

(ii) Table for estimation of Ca^{II} :

No. of titrations	Volume of stock solution taken (mL)	Burette reading of EDTA solution (mL)			
		Initial	Final	Difference	Most frequent reading
1	25	0	18.7	18.7	18.7
2	25	0	18.6	18.6	
3	25	0	18.7	18.7	

2020

CHEMISTRY — HONOURS — PRACTICAL

Paper : DSE-B-2P

(Novel Inorganic Solids)

Full Marks : 30

*The figures in the margin indicate full marks.*Answer *all* questions.

1. For the determination of the $[K^+] : [H^+]$ ratio in the given $KHSO_4$ sample by cation exchange method :
- (a) Write down the principle mentioning all the equations involved and derive the working formula. 15
- (b) Using the following data calculate the strength of $\sim 0.02(N)$ NaOH solution. $2\frac{1}{2}+2\frac{1}{2}$
- (i) 0.1311 g of oxalic acid has been accurately weighed, transferred to a 100 mL volumetric flask and volume is made up with distilled water.
- (ii) Standardization of $\sim 0.02(N)$ NaOH by standard oxalic acid solution

No. of titrations	Volume of standard oxalic acid taken (mL)	Burette reading of NaOH solution (mL)			
		Initial	Final	Difference	Most frequent reading
1	5	0	5.5	5.5	5.5
2	5	0	5.4	5.4	
3	5	0	5.5	5.5	

- (c) Using the above data, calculate the $[K^+] : [H^+]$ ratio in the given $KHSO_4$ solution by using the following specimen results. 5+5
- (i) Standardization of $KHSO_4$ solution :

No. of titrations	Volume of $KHSO_4$ solution taken (mL)	Burette reading of NaOH solution (mL)			
		Initial	Final	Difference	Most frequent reading
1	5	0	5.7	5.7	5.8
2	5	0	5.8	5.8	
3	5	0	5.8	5.8	

Please Turn Over

- (ii) Table for estimation of $([K^+] + [H^+])$ after passing the solution through the cation exchange column in H^+ form :

No. of titrations	Volume of $KHSO_4$ solution taken (mL)	Burette reading of NaOH solution (mL)		
		Initial	Final	Difference
1	5	0	11.5	11.5
