TITRIMETRIC ANALYSIS OF POLYHYDROXY COMPOUND (MANNITOL) BY USING PFC (PYRIDINIUM FLUORO CHROMATE) REAGENT

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ABSTRACT: In present paper Quantitative oxidation of some polyhydroxy compound like mannitol by using simple titric method determination with pyridinium flouro chromate (PFC) reagent.In any of a class of organic compounds that are polyhydroxy aldehydes or polyhydroxy ketones are change to such substance on simple chemical transformation, as hydrolysis, oxidation,reduction and that form the supporting tissue of plants and are important food for animal and people. other Polyhydroxy compounds act as a key chemical intermediate for the production of a variety of fine or special chemicals such as pharmaceutical drugs, dyestuffs, and also use preparation of oral liquid dosage form by replacement of water by some non- aquoes solvents. Polyhydroxy compounds cointaining two or more than hydroxyl group like mannitol . Mannitol is a type of sugar alcohol which is also used as a medication . It is an osmotic diuretic used to remove excess water and toxins from the body in patients with kidney disease. Due to simplicity and convenience the titrimetric method has widely been used for the determination of many organic as well as medicinal compounds.

KEYWORDS: Titrimetric analysis, Quantitative Oxidation of mannitol, Standard drug addition method, PFC reagent, SD,CV, Recovery%.

INTRODUCTION: Titration is a common laboratory method of Quantitative chemical analysis that is used to determine the unknown concentration of a known reagent.Because volume measurement play a key role in titration. It is also known as volumetric analysis. A reagent called Titrant or titrator , of a known concentration and volume is used to react with a solution of the analyte or titrand whose concentration is not known. Due to simplicity and convenience the titrimetric method has widely been ued for the determination of many organic as well as medicinal compound Polyhydroxy compound are carbohydrates, polyhydroxy aldehydes , ketons and their anhydrides. Mannitol is a type of polhydroxy alchohal .Generally used for medication , it is a osmotic diuretics. Diuretic is a substance that promotes dieresis, ,the increased production of urine. It is also known as Water Pills.are medication use to increase the amount of water and salt expelled from the body as urine. These drug that can stimulate the kidney to the electrolyte and water. Mannitola and glycerine are osmotic type drugs. Osmotic diuretics are freely filtered at glomerulus but not reabsorbed causes water to be retained in these segment and promote a water diuresis.Mannitol is often used as a sweetner in diabatic food and poorly absorbed from the intestine. Polyhydroxy compounds act as a key chemical intermediate for the production of a variety of fine or special chemicals such as pharmaceutical drugs, dyestuffs, and also use preparation of oral liquid dosage form by replacement of water by some non – aqueous solvent .Mannitol

Requirements to chemical reaction used in titrimetric method of analysis:

1. Reaction between reagent and analyte must be specific.Titrant can not react with impurities or addition of the analytical solution.

2. Reaction must be stoichiometric.

3. Titrant must react rapidly with the analyte so that the time required between addition of reagent is minimised.

4. Titrant must react more or less completely with analyte so that satisfactory end point are realised.

5. Undergo a selective reaction with the analyte that can be discribe by simple balanced reaction .

6. In this method the amount of a titrant used to reach the end point correspound to the weight of species to be determined.

ANALYTICAL METHOD:

1.. Sampling and Preparation of sample.

2. Processes used to bring the Constituent to be analysed into the state necessary for required test.

3. Quantitative Analysis.

4. Interpretation of the information obtained and calculation of the result.

EXPERIMENTAL : Preparation Of Reagent And Solution

Pyridinium Fluoro Chromate - solution 0.03N : 495 mg of pyridinium fluorochromate was dissolved in 150 ml of glacial acetic acid and made Up to the volume with 250 ml distilled water in volumetric flask. The solution was standardised Iodometically.

Sodium Thiosulphate Solution (0.01)N : solution of prepare thiosulphate was prepared by Dissolving 2.4819gm in 1000ml distilled water and standardization by 0,01N potassium dichromatic Solution iodometrically.

Potassium Dichromate Solution (0.01N Standardisation of sodium thiosulphate against Potassium dichromate solution calculate precision normality (molarity) of sodium thiosulphate standard solution accordanc to equivalents law.

Potassium Iodide Solution : 10% W/V aqueous Solution was prepared in distilled water.

Starch Solution: 1% W/V aqueous solution of starch was Prepared in distilled water.

Sample Solution: tablet solution : the powder eqIvalent to 100 mg of sample was taken in 100ml .Calibrated volumetric flask and dissolved in minimum amount of distilled water.

Injection solution: 1mg/ml

General Pprocedure : aliquot containing 1mg of The sample were taken in 100ml in conical flaskand 5 ml of 0.03 N (PFC) and 10 ml of 5N H2SO4 was added to it. The reaction mixture shaken andallowed to react required reaction time at room temp. for 15 minute. after reaction was over5ml of 10% K I (sol) was added to it and shaken and Stand for 1 min. Librated iodine was titrated With 0.01N sodium thiosulphate using starch as indicator. A blank experiment was also run Under identical condition using all the reagents except sample. The amount of the sample recovered was calculated by the difference in titre value of sodium thioSulphate solution for blank and actual experiment.

CALCULATION : mg of sample = M * N (B-S)/n Molecular weight of sample (M), Normility (N)Volume of thiosulphate sol for blank.(B), volume of thiosulphate sol with sample. Stoichiometryof Reaction (n). Standard deviation (SD), cofficent of variation and recovery% .experiment were carried out byStandard drug addition method.

SEMI MICRO DETERMINATION OF MANNITOL (PURE) WITH PFC REAGENT IN ACIDIC MEDIUM

s.n.	Aliqoute taken (ml)	Amount taken (mg)	Reaction Time (min)	molecularity	Amount obtained	Error %	SD	CV
1	1	0.980	55	2	0.970	1.02	0.0022	0.2260
2	2	1.960	55	2	1.945	0.76	0.0017	0.0920
3	3	2.950	55	2	2.928	0.74	0.0037	0.1270
4	4	3.935	55	2	3.905	0.76	0.0039	0.1020
5	5	4.925	55	2	4.895	0.60	0.0054	0.1110

SEMI MICRO DETERMINATION OF MANNITOL BY (PFC) REAGENT IN ACIDIC MEDIUM

s.n.	Aliqoute taken (ml)	Amount taken (mg)	Reaction Time (min)	molecularity	Amount obtained	Error %	SD	CV
1	1	0.995	55	2	0.985	1.00	0.0017	0.1720
2	2	1.990	55	2	1.975	0.75	0.0025	0.1260
3	3	2.990	55	2	2.969	0.70	0.0023	0.0786
4	4	3.980	55	2	3.956	0.60	0.0018	0.0460
5	5	4.984	55	2	4.955	0.58	0.0028	0.0568

- Average of nine determination

RESULT: * Recovery studies of Sulphacet amide sodium by standard drug addition method

S. N.	Number of observations (N)	Amount present (pure) (mg)	Amount of drug added (mg) X	Total amount of drug obtained by calculation (mg)	Amount of drug obtained by calculation (mg) Y	XY	X^2	Recovery %
1	3	0.980	0.973	1.988	0.990	0.963	0.946	99.24%
2	3	0.980	1.987	2.928	1.945	3.864	3.948	
3	3	0.980	2.975	3.955	2.960	8.806	8.850	
4	3	0.980	3.988	4.985	3.996	15.93	15.90	
	∑N=12		∑X=9.923		∑Y=9.891	∑XY=29.563	$\sum X^2$ = 29.644	

CONCLUSION: The quantitative performance of suitable chemical reaction and either measuring the amount of reagent needed to complete the reaction or assertaning the amount of reaction product obtained .sampling and preparation of sample, observation and calculation and result as recovery percent by using stanrard drug addition method.

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