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AZINE DYES AS SIMULTANEOUS KINETIC DETERMINATION OF AMINO ACID USING CHLORAMINE-B OXIDISING AGENT

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Abstract

Differential reaction rate methods are an area of recent exploitation in chemical analysis for the resolution of mixtures of closely related species.

Keywords: Chloramine-B, Amino acids, Hydroquinone,

Introduction

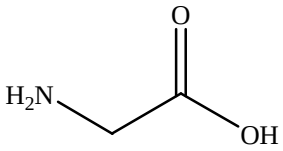
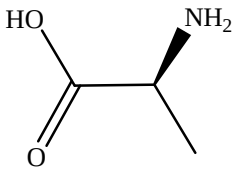
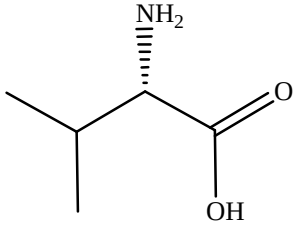
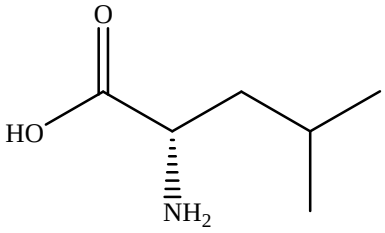
Neutral oxidizing is the only Azine dye that has been reported as an oxidizing indicator in titrations of As^{III} and Sb^{III} with chloroamine-B (CAT). In this communicate in the present in the result of our investigations on the use of six azine dyes, Phenosafranine (PS), Methylene violet (MV), Amethyst Violet (AV), Safranine-T (ST), Wool fast blue (WFVBL), Colour index numbers 50200, 50210, 50225, 5024050315 respectively and Aposafranine (AS), as oxidizing indicators in titrations of As^{III}, Sb^{III}. Hydroquinone, Aspcorbic acid, Hydrogen and Isonicotinic acid hydrazide (INH), with CAT neutral and hydrochloric, sulphuric and acetic acid media.

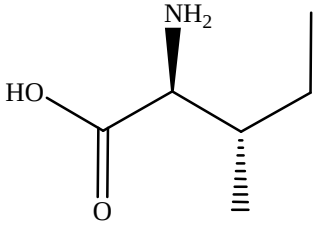
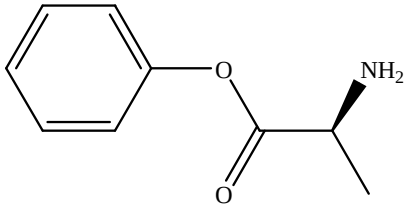
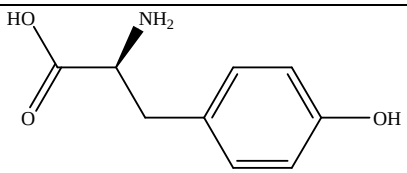
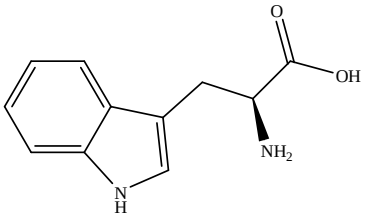
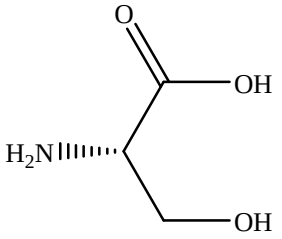
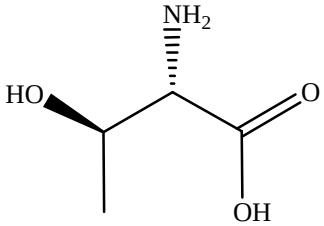
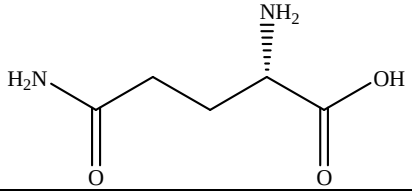
Result and discussions:

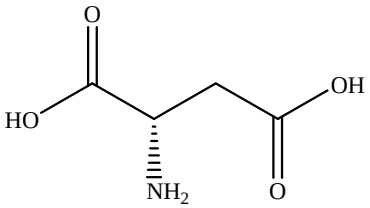
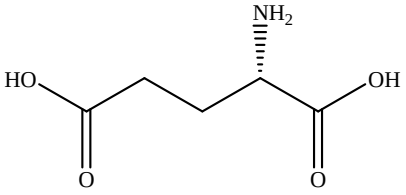
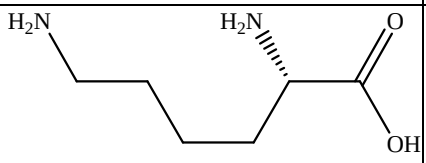
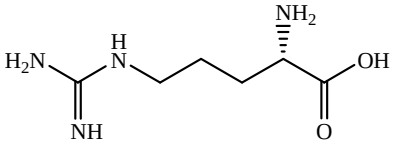
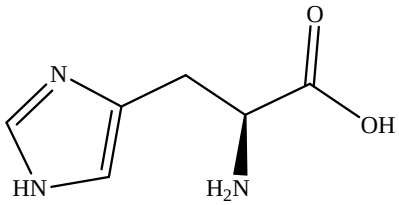
The detailed kinetic, mechanistic and thermodynamic aspects of the reaction have been discussed by many workers. It showed that as fixed (H_2SO_4) with substrate in excess flats of in$[CAB]_0$ versus time as linear indicating a first order dependence in $[CAB]_0$. The Pseudo first order rate constant K^1 increased with increase $(Amino\ acid)_0$, and flats of Ink^1 versus in $[Amino\ acid]_0$ are linear with units Slopes, Conforming the first order dependence in $[Substrate]_0$.

The reaction showed a first order dependence each in $[Oxidant]_0$ and $[Amino\ acid]_0$ and inverse first order in $[H^+]$. The rate of oxidation increases in the order Leucine>Alanien>Glycine. The mechanism assumes the interaction of zwitter ion of substrate with CAB in the rate limiting step. The flat of in (b-x)/ (a-x) versus T is a straight line with H is the decrease in the concentration of the reactant at time T and A and B are the initial concentrations of AA and CAB respectively.

STRUCTURES, COMMON ABBREXVIATIONS, MOLECUAR WEIGHTS, DISSOCIATION CONSTANTS AND pH VALUES.

S.No	Name	Abbreviation	Structure	M.Wt	PKa values			ISO Electric pH
					pK^1	pK^2	pK^3	
1	Glycine	Gly G		75	2.34	9.60		5.97
2	Alanine	Ala A		89	2.34	9.69		6.01
3	Valine	Val V		117	2.32	9.62		5.97
4	Leucine	Leu L		131	2.36	9.60		5.98

5	Iso leucine	Ile I		131	2.36	9.68		6.02
6	Phenyl alanine	Phe F		165	1.83	9.13		5.48
7	Tyrosine	Tyr Y		181	2.20	9.11	10.07	5.66
8	Tryptophan	Trp W		204	2.38	9.39		5.89
9	Serine	Ser S		105	2.21	9.15		5.68
10	Threonine	Thr T		119	2.11	9.62		5.87
11	Glutamine	Gln Q		146	2.17	9.13		5.65

12	Aspartic acid	Asp D		133	1.88	9.60	3.65	2.77
13	Glutamic acid	Glu E		147	2.19	9.67	4.25	3.22
14	Lysine	Lys K		146	2.18	8.95	10.53	9.74
15	Arginine	Arg R		174	2.17	9.04	4.48	10.76
16	Histidine	His H		155	1.82	9.17	6.00	7.59

Experimental Section:

Approximately 0.1 N solutions of CAT, Sb^{III} hydrazine, hydroquinone and INH where prepared and standardized. Standard solution (0.1 N), of As^{III} and 0.1% solution of the Dyes in deionized water we are also prepared. The following Dye samples where used PS, MV, AV, ST and AS and WFVBL (Bayer). Other chemicals used where of reagent great quality.

A liquots of the reductant solution (0.1N of 0.025N) was treated with sufficient 1:1 hydrochloric, sulphuric or acetic acid and water so as to give the required overall acidity when diluted to 50 ml. A 0.1% indicator solution (0.1 ml) was

then added and the mixture titrated with Ca_2 solution, Potassium bromide solution being added wherever necessary. The condition of titrations and colour changes at end points of the given table. The results obtained are in excellent agreement with those obtained by other methods.

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