Determination of ascorbic acid and acetylsalicylic acid in commercial preparations using an electronic tongue

Pereira, O. R.[(1)*], Gomes, C.[(1)], Gonçalves, C.[(1)], Borlido, D.[(1)], Batista, M.[(1)], Teixeira, Tatiana[(1)], Dias, Luís G.[(2)]

[(1)] DTDT, Escola Superior de Saúde, Instituto Politécnico de Bragança; [(2)] CIMO, Escola Superior Agrária, Instituto Politécnico de Bragança; *oliviapereira@ipb.pt

Introduction

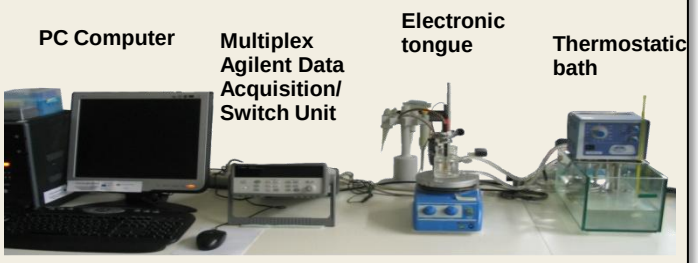
The electronic tongue (ET) is a multi-sensors system used to identify the basic standards of taste[1,2]. Although the main purpose of ET is the qualitative analysis, the quantitative analysis of substances in a liquid matrix is also possible, having been the subject of these preliminary studies the application of electronic tongue to pharmaceutical products[3].

The aim of the current study was the quantitative analysis of ascorbic acid (AA) and acetylsalicylic acid (ASA) in commercial preparations using an ET.

Materials and Methods

- Standard calibration solutions
- Solutions of commercial formulations of AAC: Cecrisina, Redoxon, Cebion Immun 2, Cebion Plus®
- Solutions of commercial formulations of AAS: Melhoral , Aspirina C, Anadin Extra, Bisolgrip T ®, Ácido Acetilsalicílico

Analyzed by electronic tongue at 25ºC, after 20 min of stabilization



The multivariate calibration to AAC or AAS was obtained by relation of concentrations of test compounds with the respective profiles of signals obtained from the analysis with the ET

Multiple linear regression (MLR) method was used

References

1- Dias LA, Peres AM, Veloso ACA, Reis FS, Vilas-Boas M, Machado AASC. Sensors Actuato B Chem. 2008; (136) 209-217.

2- Dias LA, Peres AM, Vilas-Boas M, Rocha MA, Estevinho L, Machado AASC. MicrochimiActa. 2008; (136) 97-102.

3- Zheng ZY, Keeney MP. J Pharmaceut. 2006; (310) 118-124.

Results

The MLR model obtained selected polymeric membranes shown in the following equation of the line:

AAC

$$Log(C_{AAC}) = -4{,}733 - 5{,}965 \cdot A2 + 24{,}679 \cdot C4 - 17{,}600 \cdot A3 + 88{,}859 \cdot F2 + 20{,}060 \cdot D4 - 65{,}438 \cdot E6$$

AAS

$$Log(C_{AAS}) = -0{,}580 - 7{,}441 \cdot A2 - 9{,}709 \cdot F1 + 12{,}653 \cdot F3$$

	AAC	AAS
RLM model	Acceptable Linear relation R^2= 0.964	Weak Linear relation R^2=0.797
Λ de Wilks test	p<0.05	p<0.05
ANOVA test	p<0.001	p<0.001
Durbin-Watson test	1.671	0.742

Conclusions

- Polymeric membranes selected for the MLR models are significant;
- Models was globally significant;
- There was independence of errors.

⇨ **The ET can be used to determine the quantity of AAC in effervescent formulations;**

⇨ **The model prediction for AAS shows a poor performance, which can be explained by the influence of the drug matrix, since significantly affect the signals from the sensors ET.**