

# APPLICATION OF A SPE MULTIRESIDUE METHOD FOR THE DETERMINATION OF ANTINEOPLASTIC DRUGS IN WASTEWATER SAMPLES

S. Santana-Viera, P. Hernández-Arencibia, R. Guedes-Alonso Z. Sosa-Ferrera, J.J. Santana-Rodríguez.  
Instituto Universitario de Estudios Ambientales y Recursos Naturales (i-UNAT), Universidad de Las Palmas de Gran Canaria, 35017, Las Palmas de Gran Canaria, Spain  
e-mail: [sergio.viera@ulpgc.es](mailto:sergio.viera@ulpgc.es)

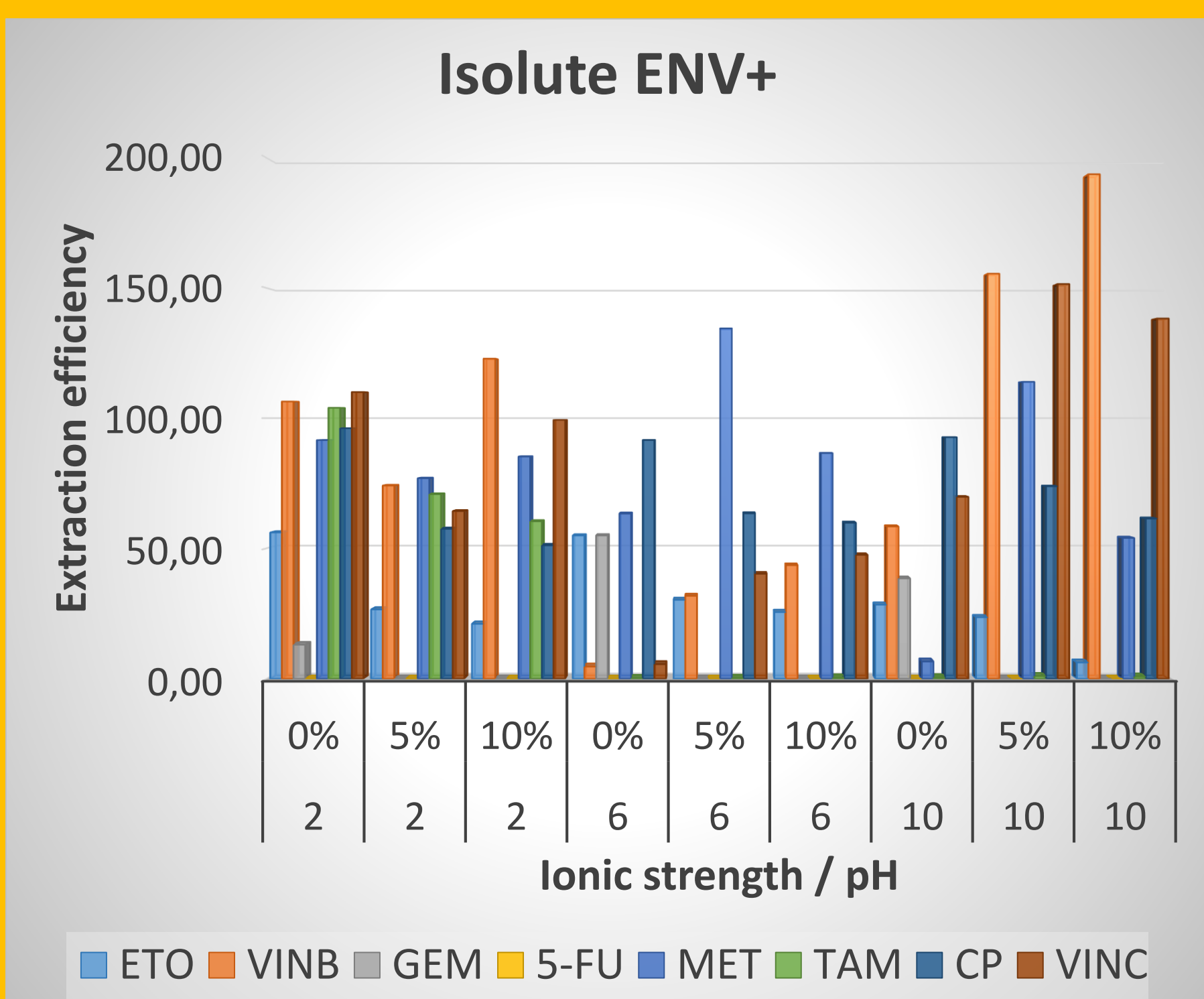
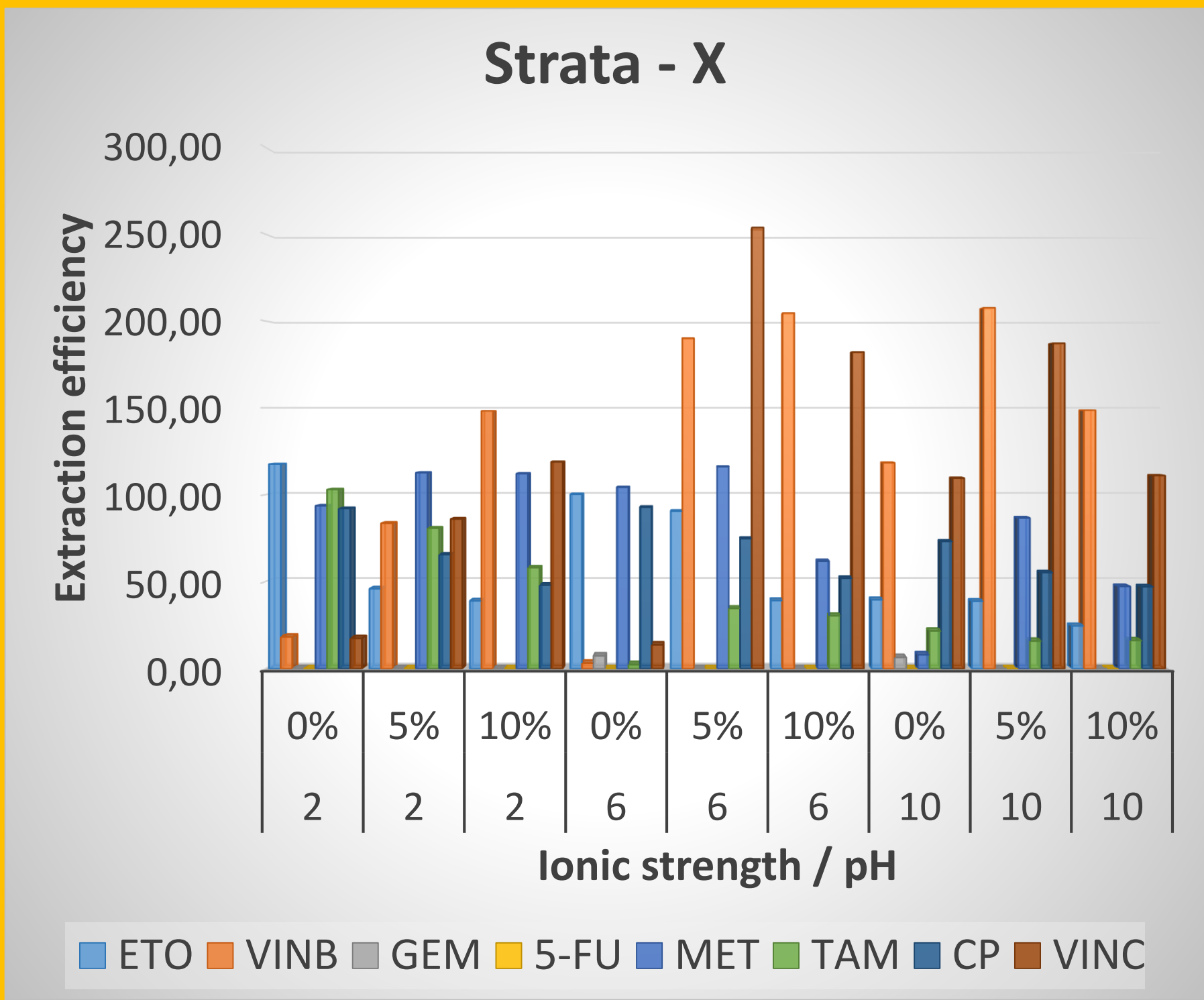
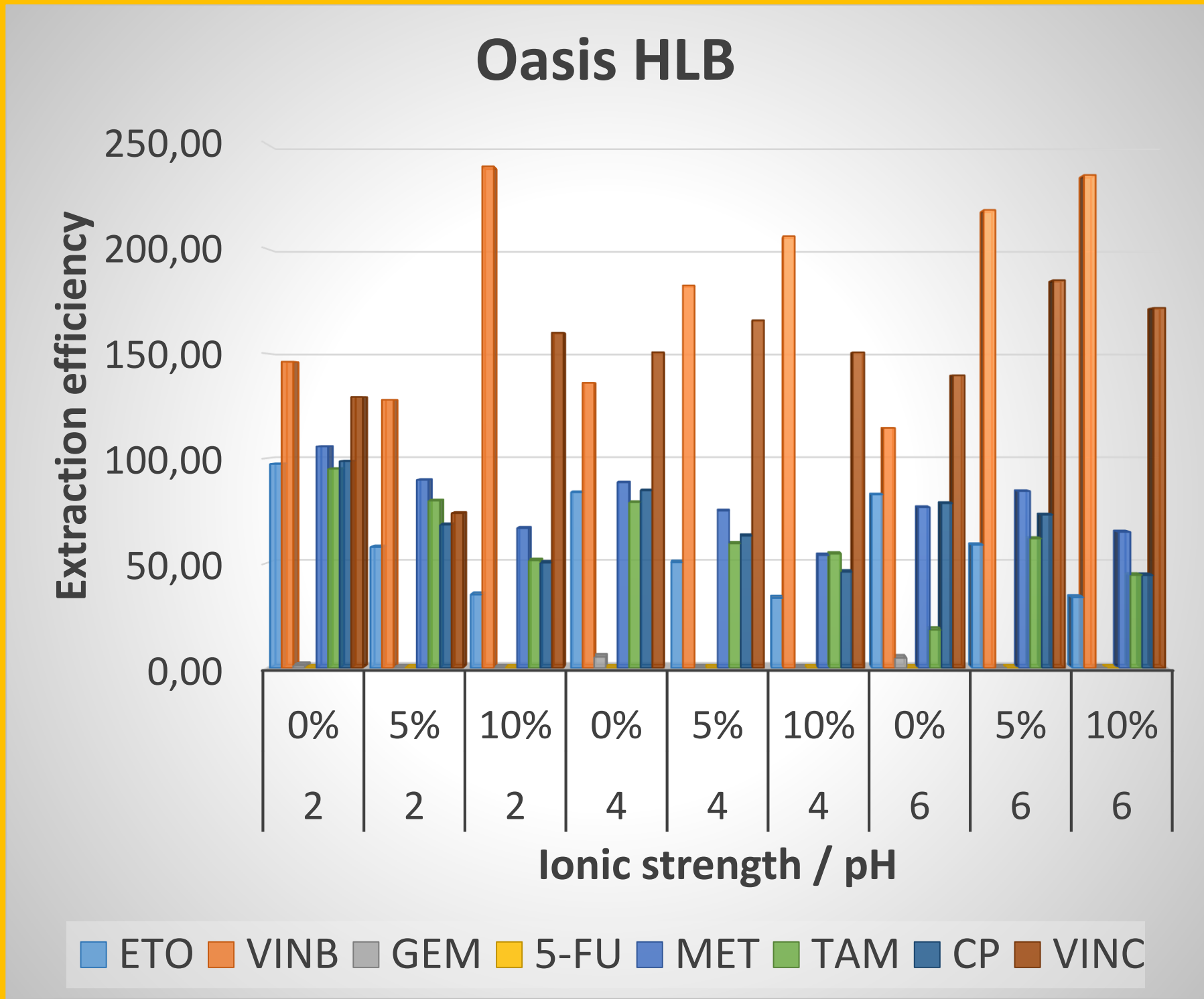


## INTRODUCTION

The physicochemical properties of the antineoplastic compounds, makes it very difficult to extract several of them at a time. For example, for the determination of cyclophosphamide (CP) and ifosfamide (IF), two nitrogen mustard analogues, the Strata-X cartridges were used successfully<sup>1</sup>. The Isolute ENV<sup>+</sup> cartridges were used in the extraction and preconcentration of pyrimidine analogues such as fluorouracil (5-FU) and capecitabine (CAP)<sup>2</sup>. However, when determining a larger group of antineoplastics of different categories all cartridges should be tested to find the best of them. In this work, eight antineoplastic compounds: Etoposide (ETO), Vinblastine (VINB), Gemcitabine (GEM), 5-FU, Methotrexate (MET), Tamoxifen (TAM), CP and Vincristine (VINC) were studied under different extraction conditions with 4 different cartridges.

## EXPERIMENTAL

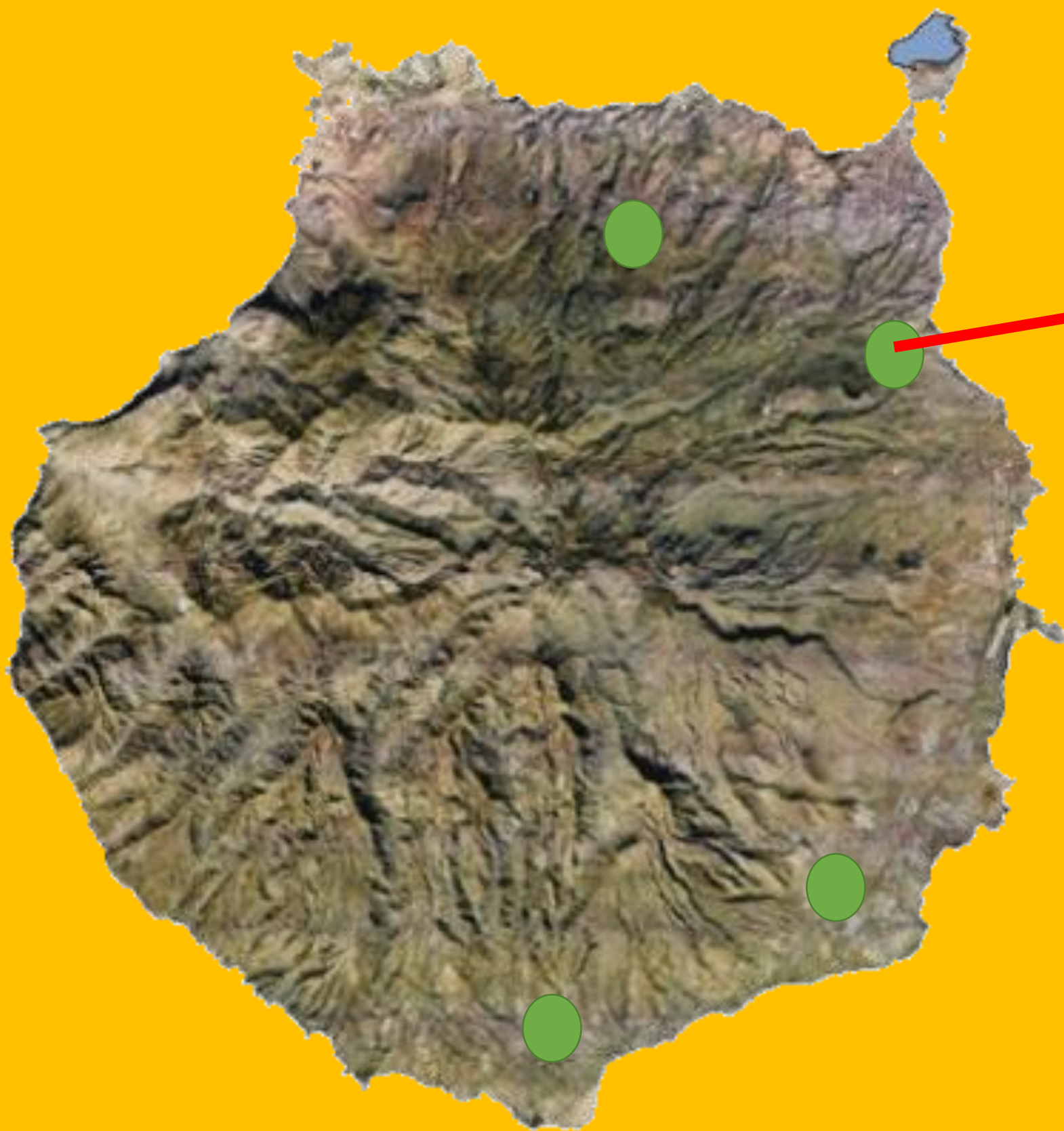
Due to the fact that a large volume of sample would clog the cartridges when working with waste water, 250mL was decided for the experimental design. Then, a 3<sup>2</sup> experimental design, with two variables (pH and ionic strength) at three levels were carried out with all cartridges.



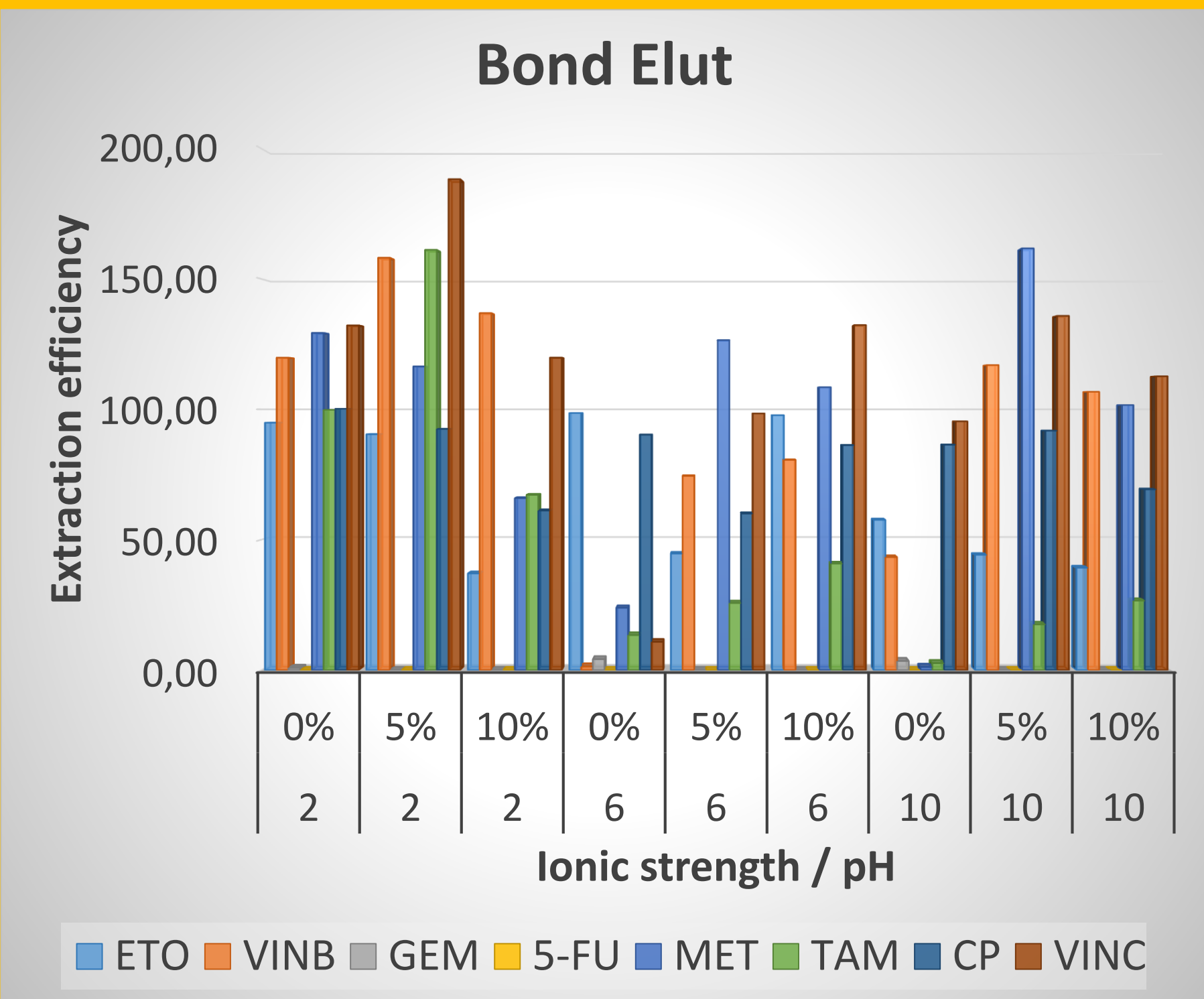
## APPLICATION IN WASTEWATER WITH OASIS HLB

Optimum conditions	
Sample volume	250 mL
Sample pH	4
Sample ionic strength	0%
Elution solvent	Methanol
Elution volume	5 mL dried under a stream of nitrogen and reconstituted in 1 mL

Wastewater samples from four WWTPs of the island of Gran Canaria was taken in the months of October, January and April.



CP was detected in the months of October (91,25ng/L and January (86,30ng/L).



## CONCLUSIONS

- A method for the determination of antineoplastic compounds has been optimized and applied to real wastewater samples.
- In spite of the suppression of the signal due to the matrix, good LODs, between 1,34 ng/L and 77,88 ng/L (effluent) and between 0,84 ng/L and 103,95 (influent), were achieved.
- CP was detected in the effluents of the main wastewater treatment plant of the island in the months of October and January, at concentrations of 91.25 and 86.30 ng/L, respectively.

[1] N. Llewellyn, P. Lloyd, M.D. Jürgens, A.C., J. Chromatogr. A. 1218 (2011) 519–8528.

[2] J. Martín, D. Camacho-Muñoz, J.L. Santos, I. Aparicio, E. Alonso, J. Sep. Sci. 34 (2011) 3166–3177

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