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DETERMINATION OF FREE METAL ION CONCENTRATION WITH THE SPECIATION TECHNIQUES AGNES AND DMT

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The aim of this work is to study a possible alteration in the electroanalytical technique AGNES (Absence of Gradients and Nerstian Equilibrium Stripping) signal due to the electrodic adsorption. Several systems with induced adsorption have been studied, establishing that when the special AGNES equilibrium situation at the end of the first stage is reached, the existence of other equilibria processes (as adsorption) do not disturb the amount of M^0 via different AGNES variants. The analytical signal (current under diffusion limited conditions or charge) is not affected by any process in solution (as adsorption) [1]. AGNES is applied to the study of the system Zn-Glutathione, firstly in synthetic samples and later in root extracts of *Hordeum Vulgare*. Four different models were introduced in the speciation program VMinteq. Several titrations were performed varying pH and $C_{T,GSH}$ and recording the free metal concentration. Theoretical results of two of the models agree with AGNES determination. In the root extract, the experimental determined concentration was much lower than the predicted one, suggesting the presence of other ligands (as phytochelatins) [2]. In the case of the wine's study, AGNES and the non-electroanalytical technique DMT (Donnan Membrane Technnique) were used with the aim of comparing the results. Free metal determinations in synthetic wine sample agreed with the predicted ones, but the required time to reach the equilibrium was longer. When working with real wine, it required even longer times. For the ICP-MS analysis of the sample, the method of the isotopic dilution was used. DMT results agreed with the corresponding ones using AGNES [3].

ADVISERS/MENTORS

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