

Abstract

Detection of Biogenic Amines in Canned Tuna Using a Voltammetric Electronic Tongue †

Marta Bonet San Emeterio, Maria Bruguera Jané, Xavier Cetó and Manel del Valle *

Sensors and Biosensors group, Chemistry Department, Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain

* Correspondence: manel.delvalle@uab.cat

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Abstract: Biogenic amines (BAs), produced naturally due to the decomposition of amino acids, are crucial for food industry because the formation of BAs is directly related to improper storage and the presence of bacteria; high concentrations of BAs could be related easily with the quality and spoilage of the products of this sector. The necessity to quantify quickly and efficiently these targets makes mandatory the use of alternatives to conventional analytical methods used up to now. For example, sensors combined with chemometric tools are a promising alternative for quick and informative analysis in the food sector. Chemometric tools allow to develop models for the quantification of concrete compounds in complex matrix, making it a feasible tool for the development of more user-friendly methods than the traditional used since now. This work presents a model created for the detection of histamine (Hys), cadaverine (Cad) and tyramine (Tyr) using a set of 5 modified GEC (Graphite Epoxy Composite) electrodes: ZnO, CuO, SnO₂, Bi₂O₃, and Polypyrrol, used in a voltammetric multisensory array approach. In the graphics below it could be observed the results obtained with an Artificial Neural Network (ANN) with 51 input neurons, 5 neurons in the hidden layer and 3 neurons in the output layer. The functions used for the hidden and output layers were Tansig and Purelin, respectively. The results show slopes near to 1 and intercepts close to 0, indicating the feasibility of the model.

Keywords: artificial neural networks; electronic tongue; biogenic amines; hystamine; voltammetry