

Electronic tongue system for the recognition of food samples

M.Zalewski¹ M.Wesoły²

¹*ULO im Księcia Józefa Poniatowskiego, Nowolipie 8,00 – 150 Warsaw, Poland*

Email:michalzalewski97@gmail.com

²*Department of Microbioanalytics, Warsaw University of Technology, Noakowskiego 3,00 – 664 Warsaw, Poland*

Aim of the project

The main goal of this work was to evaluate the usefulness of the potentiometric electronic tongue for the recognition of brand and storage conditions of soft beverages.

Introduction

The electronic tongue is a multisensory system dedicated to qualitative and quantitative analysis of fluid samples. It is composed of cross - selective sensors and a data analysis system which allows to extract useful information from sensor responses.

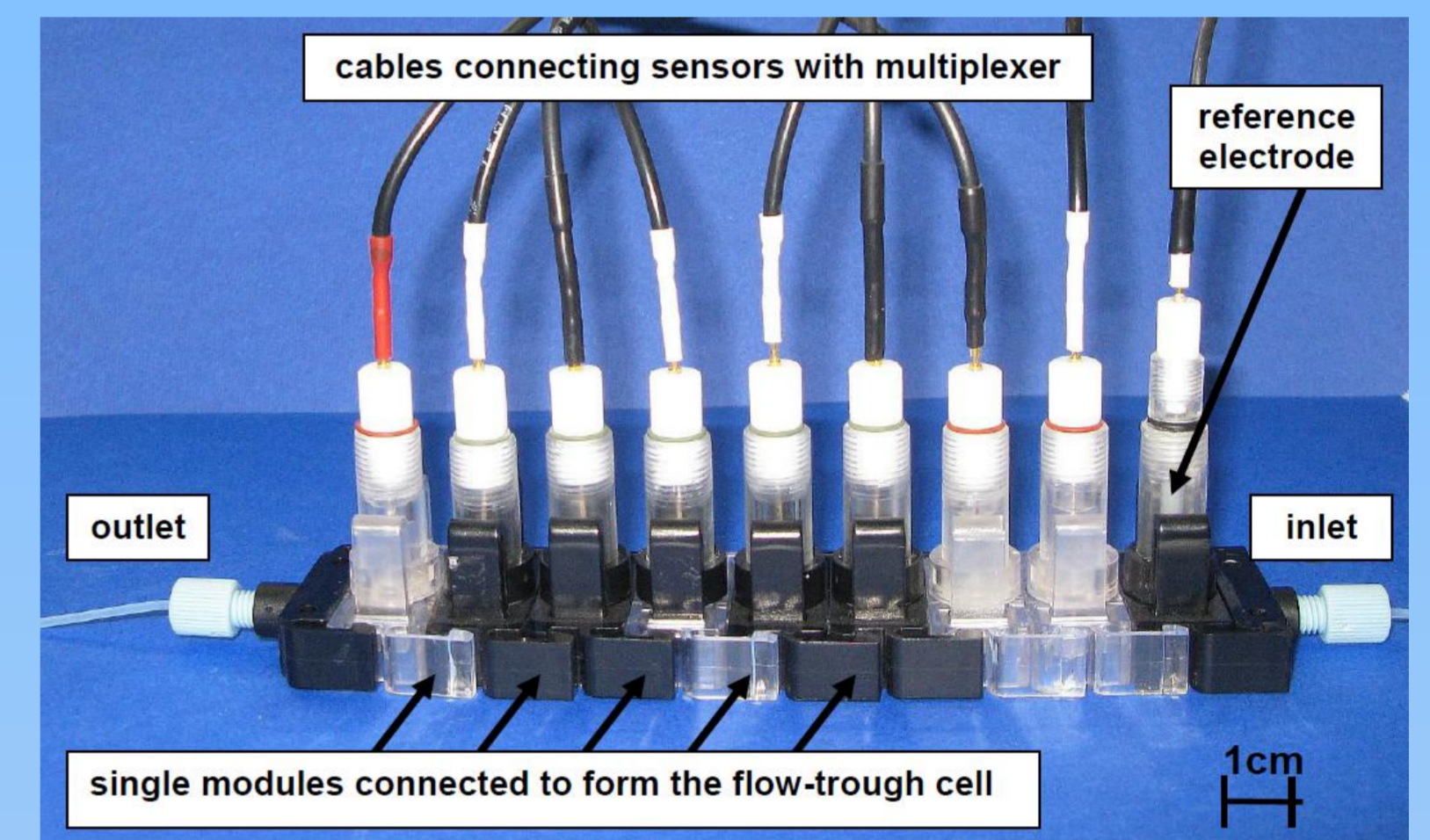
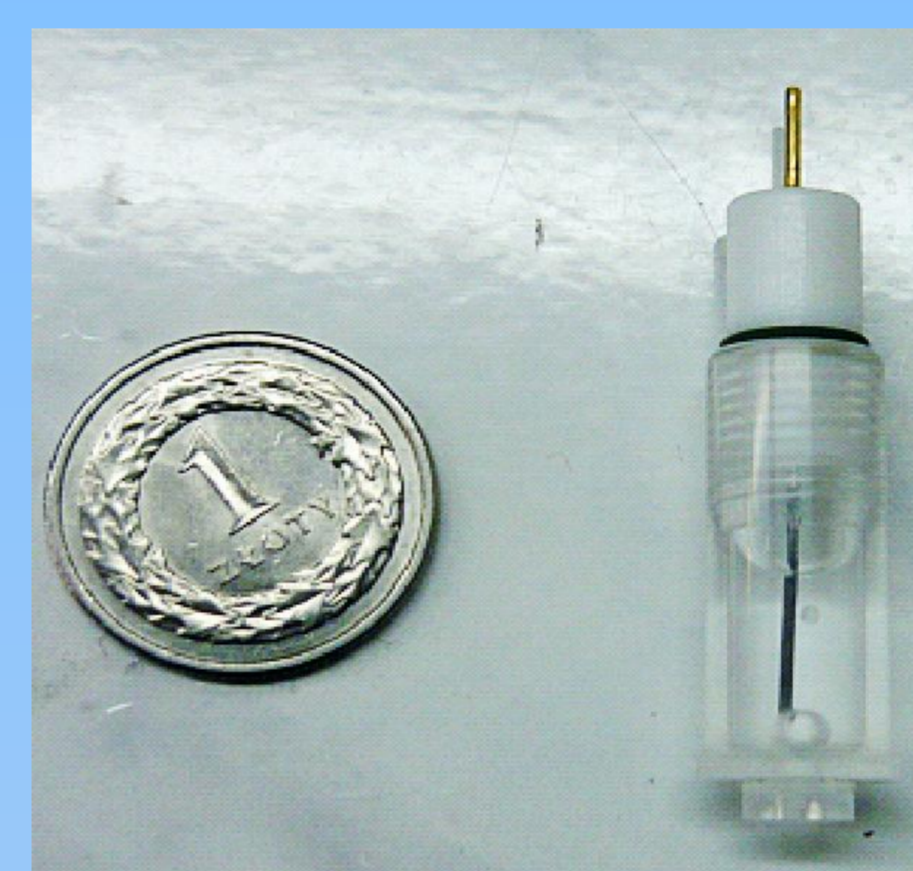
Samples

Two different kinds of samples were studied: fizzy drinks (CocaCola and Pepsi) and beer (Kasztelan). The samples had to be degassed before measuring in order to obtain reliable results, since the presence of CO₂ could disturb the sensor array signals.

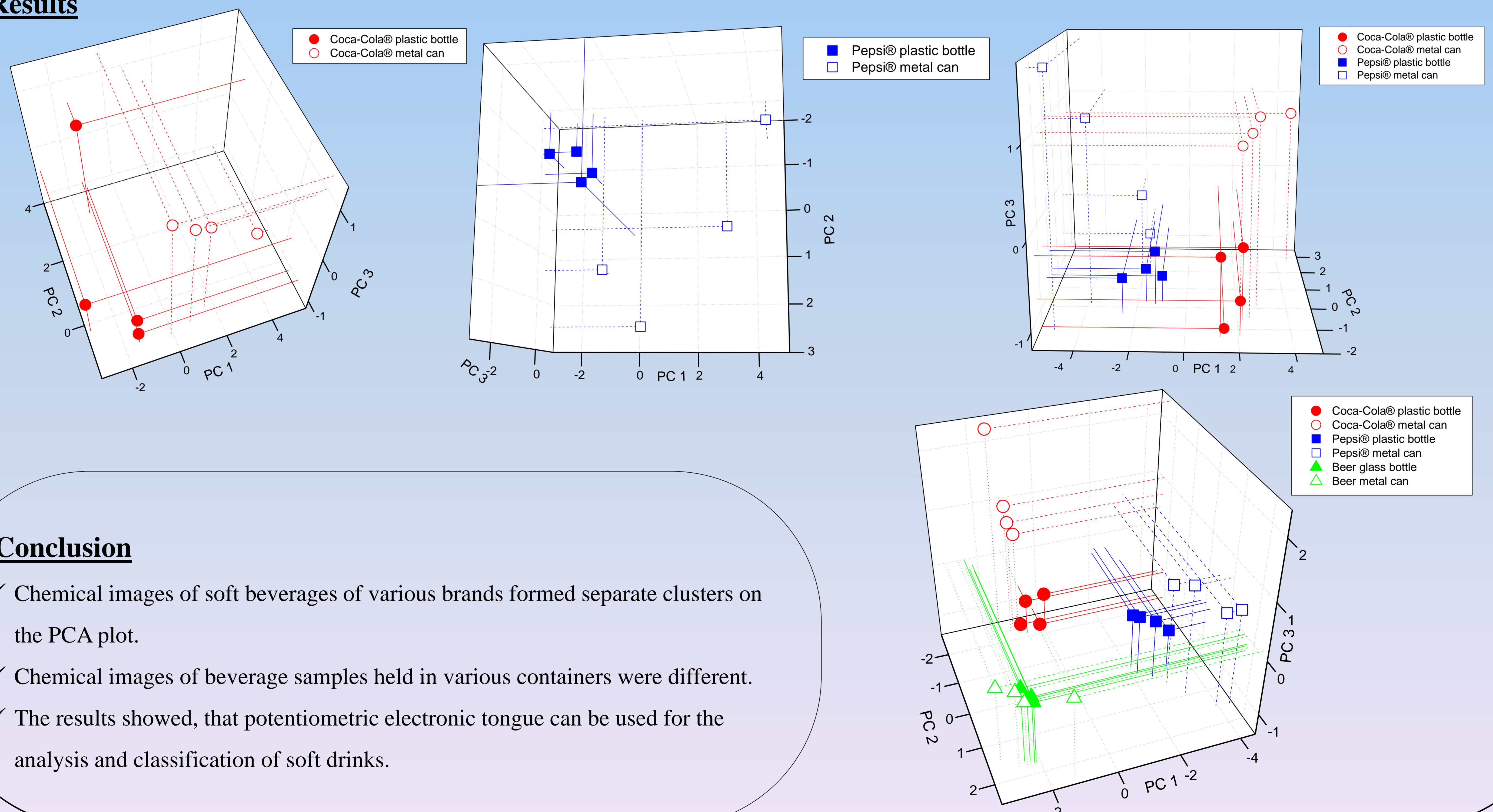
System

Sensor array was composed of ten miniaturized ion-selective electrodes, which were selective for anions and cations, especially for potassium, sodium and calcium cations. Electrodes responses were analysed by Principal Component Analysis (PCA), what allowed to draw 3D graph which is called the chemical image of sample.

	Ion-exchanger	Ionophore	Plasticizer	Polymer
Na ⁺	KTPCIPB	sodium ionophore X	DOS	PVC
K ⁺	KTFPB	valinomycin	DOS	PVC
CS	KTFPB	-	DOS	PVC
Ca ²⁺	KTPCIPB	ETH 129	DOS	PVC
AS	TDMAC	-	o - NPOE	PVC



Results



Conclusion

- ✓ Chemical images of soft beverages of various brands formed separate clusters on the PCA plot.
- ✓ Chemical images of beverage samples held in various containers were different.
- ✓ The results showed, that potentiometric electronic tongue can be used for the analysis and classification of soft drinks.

Acknowledgements

This work has been supported by the project "Politechnika dla młodego chemika – staże badawcze uczniów liceum"