Name(s)	Project Number
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Project Title

Adaptive Polymeric Electronic Nose

Abstract

Objectives/Goals

My objective is to show it is possible to electronically mimic the human sense of smell using ordinary polymers and make it adaptive by using Artificial Intelligence. A related objective is to study whether the technology is robust.

Methods/Materials

Mix 18 combinations of four polymers and six plasticizers in Tetrahydrofuran and add Carbon Black in Ultrasonic bath. Spray onto 18 pairs of conducting elements and dry them. Wire these sensors into an electronic board to multiplex and convert the electronic voltages into digital values. Develop control and Artificial Intelligence software. Setup a system to pass volatile odors onto the sensors and run the system to identify the odors.

Results

The sensor array presented distinct smell envelopes per volatile analyte. The Neural Net was properly trained by reducing error metrics. The detection of analytes was positive and conclusive.

Conclusions/Discussion

I conclude it is feasible to build at home low-cost polymeric sensor array to digitize and electronically detect volatile odors. Having tested the system last summer and now, I conclude the technology is robust with long shelf life.

Summary Statement

Under ordinary conditions, it is possible to build low-cost robust polymeric sensor to mimic human nose.

Help Received

Father helped discuss problems and supervised safety. Mother helped in transport. Dr. Shugarman supervised mixing chemicals at Chapman University lab. Dr. Allali helped understand Neural Networks.