Effectiveness of benzoyl peroxide application in the treatment of acne

Carly Olafson and James Kariuki* (University of Alberta, Augustana Campus)

Poster Presentation Abstract:

The development of a pencil graphite electrode (PGE) for use in electrochemical testing represents a sensitive, selective, disposable, and low-cost method of analysis. Despite its advantages over the traditional glassy carbon electrode (GCE) in these characteristics, the PGE lacks the reproducibility seen with the GCE. In order to better control the surface chemistry of the PGE and thus achieve a higher level of reproducibility, various electrode activation techniques were tested. The activation of an electrode is a pre-treatment method in which the electrode is coated using electrochemical processes to alter the surface chemistry of the electrode. Three different solutions were examined for the activation: 0.10 M potassium nitrate, 0.50 M sulfuric acid, and 1.0 M sodium hydroxide. Experimentation proved the sulfuric acid, applied using cyclic voltammetry, to be the most effective activation method. Once activated, the PGE was used in the analysis of coffees and teas brewed by various methods. Coffee and tea samples were prepared by a traditional coffee brewer, as well as with a Tassimo T20 Home Brewing system. Once prepared, the samples were tested using square wave voltammetry and compared to results from the Folin-Ciocalteu assay. Our results show that the activation of the PGE provided more reproducible peak currents and allowed for the determination of antioxidant content in various coffee and tea samples brewed by multiple methods.

* Indicates faculty mentor