

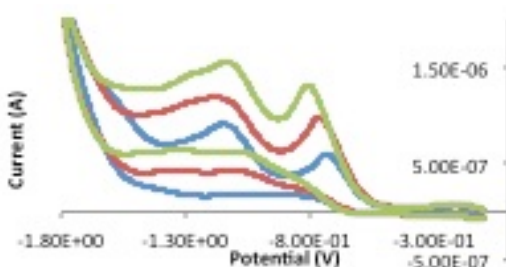
Characterization of thiol, disulfide and persulfide compounds for environmental studies using cyclic voltammetry

D. TO¹, E.J. CRANE¹

¹Pomona College, Department of Biology, 175 West 6th Street, Claremont CA 91711 USA,
daniel.to@pomona.edu, ej.crane@pomona.edu

We use cyclic voltammetry (CV), a form of electrochemistry, as an identification tool for a wide range of sulfur-containing compounds. CV allows for quick and precise *in situ* identification of redox active compounds and their relative concentrations [1]. In this system a solid-state microelectrode (Au/Hg), measures the increase in current as compounds are reduced on its surface.

A



B

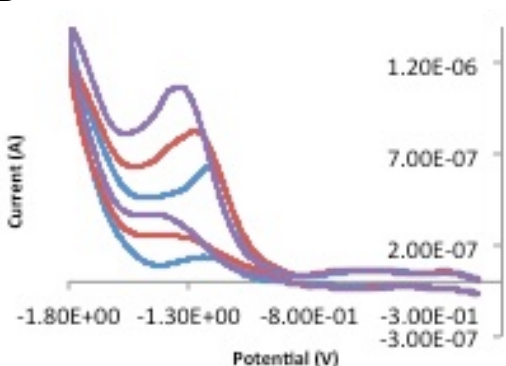


Fig 1, A: Cyclic voltammogram of increasing concentrations of glutathione disulfide (oxidized) using a solid-state Au/Hg amalgam, **B:** Cyclic voltammogram of increasing concentrations of glutathione thiol (reduced) using the same system.

In the studies described here we have characterized a range of thiol, disulfide and persulfide compounds using this method, in order to allow us to more completely define the sulfur species present in our studies of enzyme reactions, microbial cultures, and environmental settings, with the example of oxidized and reduced glutathione shown in **Fig. 1**. Although we are not yet able to use this technique for the absolute quantification of these compounds, the position and intensity of the peaks can be used to identify species and qualitatively determine relative changes in their concentration during reactions.