The Catalysis of Perchlorate Ion Electroreduction at Transition Metal Electrodes

(Funded 2002-2003)

Principal Investigators:
W. Ronald Fawcett
Department of Chemistry
UC Davis
(530) 752-1105
wrfawcett@ucdavis.edu

Thomas M. Young
Department of Civil & Environmental Engineering
UC Davis
(530) 754-9399
tyoun@ucdavis.edu

Executive Summary:
A research program is outlined to characterize transition metal electrode with respect to
their suitability as electrocatalysts for reduction of perchlorate ion in ground water to
chloride ion. The electrodes used will include nickel, rhodium and platinum in single crystal
format. The emphasis will be on developing nickel electrodes, especially after surface
modification by suitable adatoms, as catalysts for the removal of perchlorate contamination.
The initial work will involve elucidation of the fundamental electrochemistry of the reduction
process. This will be followed by a scale-up, using electrodes in a high surface area format
such as the highly active nickel catalyst.