

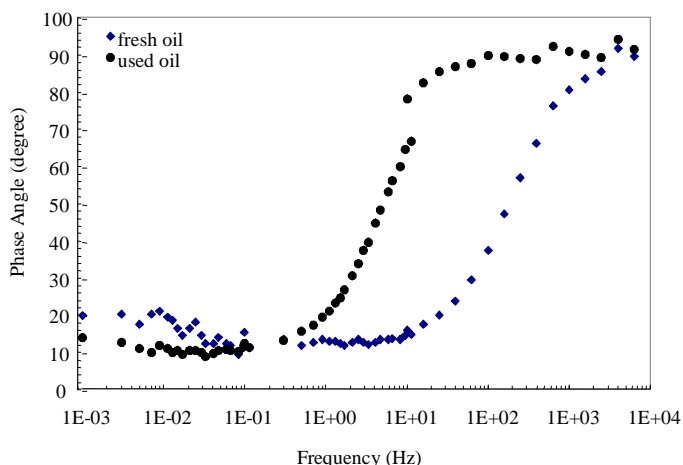
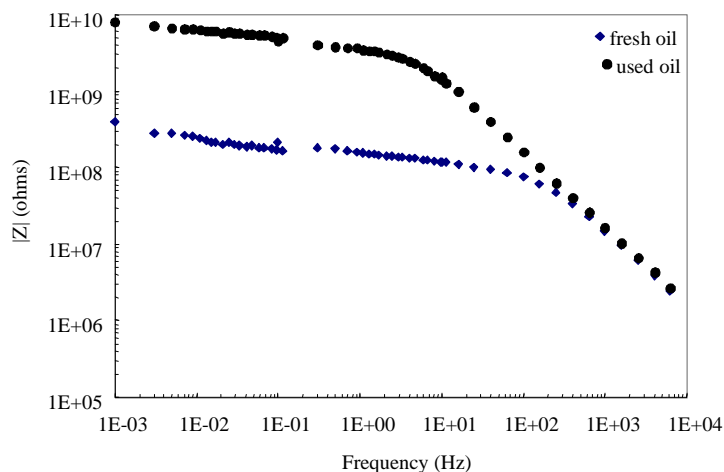
## FARADAYIC<sup>®</sup> Process for Oil and Lubricant Monitoring

### Objective:

This project demonstrated the feasibility of oil and lubricant condition monitoring using the patented FARADAYIC<sup>®</sup> Process.

### Summary:

The sensor utilizes a sophisticated AC electrochemical technique for on-line characterization of lubricants for moisture content, anti-oxidant levels and contaminants such as metal wear particles in real-time. The monitor not only aids condition-based maintenance, but also serve as an early signal for catastrophic failures of critical components. The sensor will provide a cost-effective means of improving performance and reliability, and reducing the formation of environmentally hazardous wastes. Experiments conducted on automotive oil demonstrated the feasibility of distinguishing between fresh and used oil based on the electrochemical response. The results show more than an order of magnitude difference in the faradaic resistances of two oil samples. The phase angle data shows significant differences in the capacitive components of the fresh and used oil samples. These results demonstrate the potential of AC electrochemical techniques to distinguish between the above two types of oils.



### Background:

The patented FARADAYIC<sup>®</sup> Process is an electrochemical technology that utilizes a controlled electric field to solve environmentally-challenging problems. Since the FARADAYIC<sup>®</sup> Process is electrically mediated, it does not require aggressive chemicals to facilitate the process as needed in conventional chemical processes. The process rate is determined by the applied electric field, which is user-defined and computer controlled. This provides the means for precise control of the length and total output of the process.

The FARADAYIC<sup>®</sup> Process technology illustrated above is protected by a substantial patent portfolio including issued, allowed, and pending patent actions.