



Winning Masters' Thesis Highlights EMSL Contributions

EMSL researchers and state-of-the-art equipment played key roles in helping Stephanie Sawhill win the 2004 Distinguished Masters' Thesis Award given by the Western Association of Graduate Schools/University Microfilms International. The prestigious award is given to one thesis annually for an M.S. student from universities in 13 western states and three western Canadian provinces. The selection is based on originality, significance of the study, methodology and overall quality of research.

Sawhill's thesis, *Synthesis, Characterization and Evaluation of Transition Metal Phosphide Hydrodesulfurization Catalysts*, has important implications for removing sulfur impurities in transportation fuels, leading to the production of ultra-clean fuels. "The production of ultra-low sulfur transportation fuels is critical to minimizing vehicle-related air pollution," says Sawhill, a graduate of Western Washington University.

Her thesis includes a substantial amount of research that she conducted with EMSL scientists, using the facility's XPS (X-ray photoelectron spectroscopy) and HRTEM (high resolution transmission electron microscopy) equipment. The data obtained from EMSL were included in the discussion and results sections of her thesis. "EMSL's contribution was significant," says Sawhill. "The data I obtained using XPS and HRTEM helped me to understand and develop new catalytic materials for removal of sulfur from fossil fuel."

Sawhill's use of staff and equipment at EMSL was made possible through her research advisor, WWU professor of chemistry Mark Bussell. Bussell has been collaborating with EMSL staff on catalysis research since 2000. "The quality and productivity of my research program have increased substantially since I began working with EMSL staff and instrumentation," Bussell says. "Carrying out research at the EMSL also provides excellent training opportunities for my undergraduate and M.S. students."

"Stephanie could not have had a better advisor than Professor Bussell," says EMSL's Mark Engelhard. Engelhard and Chongmin Wang are co-authors on scientific journal articles that resulted from Sawhill's thesis research. "Stephanie, as well as other students from Western Washington University, would plan for months for their visit to EMSL. Stephanie was a fast learner and had taken the time to carefully plan the analysis. This work is just one of many examples showing that EMSL has become a major contributor to advancements in catalysis research."

P.O. Box 999 Richland, WA 99352 • <http://www.emsl.pnl.gov> • 509-376-2553