

Quarterly Report April 30, 2017

MUS Research Initiative Project 51060-MUSRI2015-01: Remediation Technology for Chlorinated Pollutants Based on Natural Product from Soil Bacteria

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This project's objectives address the programmatic goal of growing important research sectors that increase the diversity of Montana's economy and lies within the 'Materials' category. The work is aimed at deriving improved materials for chlorinated pollutant remediation and is based on an effective process for carbon tetrachloride (CT) destruction in contaminated water. Progress toward specific goals to date are given below.

Objective 1: Have verified, chemically pure PDTC sulfonate, polymer-linked PDTC, and their copper complexes: December 10, 2017

- **Progress Towards Objective:** A more direct route to the 4-methanol derivative of PDTC is being explored as the route using carbonyl sulfide/dilithiation has not provided practical yields. The alternative method will involve formation of acyl chloride derivatives of protected 4-methyl- and 4-PEGyl PDTC followed by substitution with hydrosulfide as we currently use for synthesis of PDTC.

Objective 2: Have data regarding solubility and dechlorination rates for new derivatives of PDTC: April 1, 2017

- **Progress Towards Objective:** We are continuing to refine the rate constant which had been delayed by an instrument (MS detector) service issue.

Correction: Cu:PDTC solubility data was reported as “~40 mM in water of 1M ionic strength at 20°C” in our last report. That value should have been reported as “40µM”.

Objective 3: Have initial toxicology assessment of simulated remediation mixtures, refined dechlorination data to include other solvents, effects of aquifer solids: July 1, 2017

- **Progress Towards Objective:** work on this objective will await deliverables of Objective 1.

Expenditures to Date

Category	Budget Total	As of 04/30/2017
Salaries	148,405	93,719.29
Equipment	35,000	34,822.61
Supplies (MSUB)	10,514	11,241.92
Subcontracts (MSU)	71,940	51,669.03
Travel, services, other	1,600	9084.46