

**MECHANISMS OF ULTRA-HIGH EFFICIENCY CHEMICAL
SUPPRESSANTS — SPECTROSCOPY OF OPPOSED FLOW FLAMES
INHIBITED BY IRON PENTACARBONYL**

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The goal of this project is to determine how chemicals that are as or more efficient than Halon 1301 quench fires of military interest. The effort involves laser-based measurements (laser induced fluorescence (LIF) and mid- and near-infrared tunable diode laser absorption spectroscopy (TDLAS) of fuel, oxidizer, suppressant, and intermediate species present in near-extinction inhibited opposed flow CH₄/air flames at various pressures. Initial experiments use iron pentacarbonyl (Fe(CO)₅) as the chemical suppressant. Results from these experiments are compared to results from models that predict temperatures, species concentrations, and extinction strain rates for inhibited opposed flow CH₄/air flames. The framework of the effort, experimental apparatus, and initial results will be discussed.