289l A Step toward Understanding the Time, Temperature and Trace Species Concentration Dependencies of Thermal Deposition from Aviation Fuels

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A kinetic model including 136 reactions and 31 classes of chemical species has been parameterized as a set of 27 independent frequency factors, 48 independent (non-zero) activation energies, and 12 variable (unknown) initial species concentrations per fuel. Upon optimizing the parameters via a genetic algorithm, it (matched)/(will match) time-dependent deposition data spanning 2 tests (NIFTR & QCM), 7 fuels, and temperatures ranging from 140C to 225C. In addition, all of the time-dependent species concentrations remain within physically reasonable limits throughout the domain, and a variety of validation tests (are passed)/(will be passed), most notably deposition under simulated JFTOT conditions.