INTRA-ENGINE TRACE CHEMISTRY

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INTRA-ENGINE TRACE CHEMISTRY IS...

1) Post-combustion chemistry between combustor and engine exit
2) Focused primarily on species in small concentrations that have large impact on the global atmosphere

OBJECTIVES

1) Understand mechanisms that influence post-combustion trace chemistry
2) Develop modeling expertise

ANALYSIS AND SIMULATION

Trace species can change significantly through turbine and exhaust nozzle

Fundamental controls on trace chemistry

1) Thermodynamic potential
2) Reaction rates \( (T, P, [X]) \)
3) Residence time

Example: Investigate sulfur oxidation \( (SO_2 \rightarrow SO_3) \)

Process impacts aerosol and contrail formation

Impact of cycle conditions on sulfur oxidation

Impact of flow non-uniformities on sulfur oxidation

Global atmospheric impacts