Derivation for homogeneous reacting gas mixture in closed system

An adiabatic system with the volume as a function of time

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Contact info for Max Plomer

email: [maxplomer@gmail.com](mailto:maxplomer@gmail.com)

cell: 203-945-8606

Species equation

Energy equation

Pressure equation, from ideal gas law

Volume equation

= compression ratio

= rotation frequency

= angular velocity

Total mass must be constant, the system is closed and no nuclear reactions, convert volume to specific volume

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