

Databases

ENABLING REAL-WORLD ENGINEERING SIMULATIONS

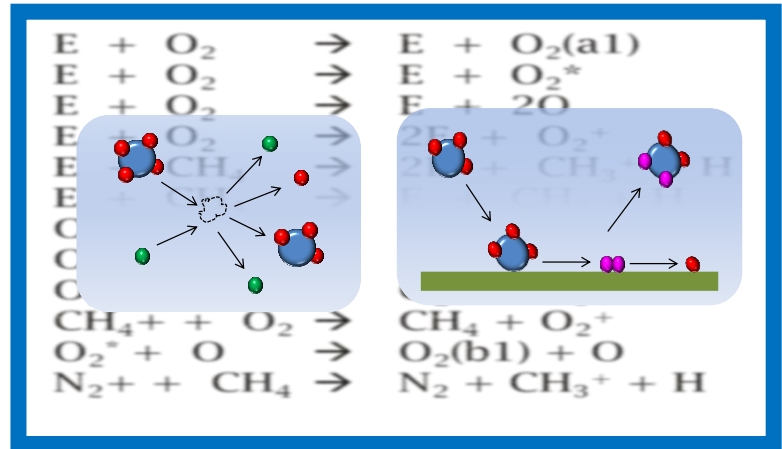
Features

Databases form the basic foundation for simulations using VizGlow, VizSpark, VizFlow, VizGrain, and ChemZone. Our databases include properties for an extensive range of gases, liquids, and solids. The different types of data needed can be categorized as follows:

- **Thermodynamic databases:** Thermodynamic properties such as specific heat, enthalpy, Gibbs' free energy using partition functions or standard polynomial fits
- **Transport databases:** Transport properties such as cross sections, mobility, diffusion coefficients, mixture specific heat, thermal conductivity, and electrical conductivity
- **Finite-rate chemical reaction databases:** Reaction mechanisms for different types of reactions (electron-impact, ion-neutral, neutral-neutral), with specializations to account for pressure and/or specific discharge types (eg. Microwave vs. Direct-Current plasmas)
- **Surface property databases:** Data for electron emission at surfaces (secondary electron emission coefficient/field emission/thermionic emission parameters), and surface chemistry databases for plasma quenching, etching, and deposition
- **Solid material databases:** Solid material property data, such as density, electrical conductivity, and thermal conductivity

The databases used by each product are as follows:

- **VizGlow** (non-equilibrium 1/2/3-D plasma): Thermodynamic, Transport, Finite-Rate Reaction and Surface Property databases
- **VizSpark** (equilibrium 1/2/3-D plasma): Thermodynamic, Transport and Solid Material databases
- **ChemZone** (non-equilibrium 0-D plasma): Thermodynamic and Finite-Rate Reaction databases



SOLUTIONS FOR YOUR MULTI-PHYSICS SIMULATION NEEDS

List of simulation packages in OverViz multi-physics simulation suite include:

- **VizGlow** Non-equilibrium Plasma simulator
- **VizSpark** Thermal (arc) Plasma simulator
- **VizEM** Electromagnetics simulator
- **VizFlow** Fluid flow simulator
- **VizGrain** Particle simulator
- **VizMesh** Geometry and unstructured meshing
- **ChemZone** Zero-dimensional reactor simulator

We also provide the following services:

- Modeling and simulation services: work with customers to define problem and setup model
- Calibration of models for customer-specific problems
- Training and support to clients using software tools

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List of chemistries available in the databases

For VizGlow and ChemZone:

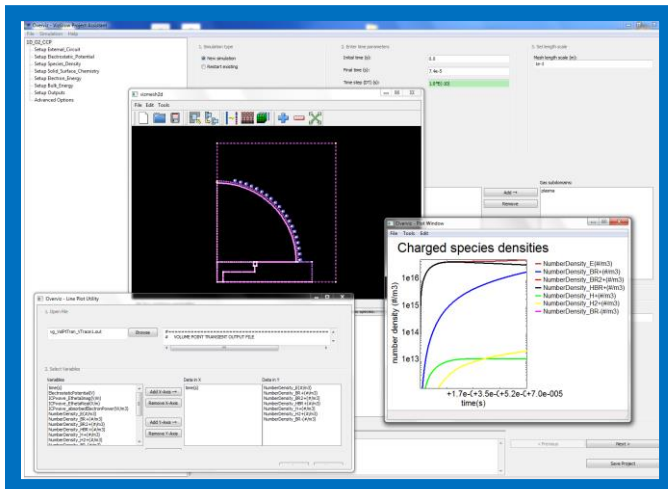
- **Pure noble gas plasmas**
 - helium
 - argon
- **Pure molecular gas plasmas**
 - hydrogen
 - nitrogen
 - oxygen
- **Molecular gas mixture plasmas**
 - argon-oxygen-hydrogen
 - air (nitrogen-oxygen)
- **Semiconductor process gas plasmas**
 - tetrafluoromethane (CF₄)
 - octafluorocyclobutane (C₄F₈)
 - trifluoromethane (CHF₃)
 - hydrogen bromide (HBr)
 - ammonia (NH₃)
 - nitrogen trifluoride (NF₃)
 - acetylene-argon (C₂H₂+Ar)
 - silane-nitrogen-oxygen (SiH₄+N₂+O₂)
 - sulfur hexafluoride-oxygen (SF₆+O₂)
- **Plasma and combustion chemistries**
 - methane-air
 - methane-air-exhaust(CO₂+H₂O)
 - GRI mechanism 3.0

(More chemistries available- please contact us for latest information)

For VizSpark:

- **Noble gas plasmas**
 - helium
 - argon
 - xenon
- **Molecular gas plasmas**
 - nitrogen
 - oxygen
 - carbon dioxide
 - sulfur hexafluoride
- **Molecular gas mixture plasmas**
 - argon-hydrogen
 - argon-carbon dioxide
 - air (nitrogen-oxygen-argon)
- **Metal vapors**
 - iron
- **Polymers**
 - polyamide 6,6 (PA66)

(More data available for other material - please contact us for latest information)



OverViz products include intuitive Graphical User Interfaces with Pre- and Post- processing capability

For more information, please contact us:



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