Molten Salt Thermal Properties Databases

The Molten Salt Thermal Properties Database–Thermochemical (*MSTDB-TC*) and Molten Salt Thermal Properties Database–Thermophysical (*MSTDB-TP*) databases are now available for public use. *MSTDB-TC* contains Gibbs energy models and values for molten salt components and related systems of interest with respect to molten salt reactor technology. *MSTDB-TP* consists of tabulated thermophysical properties and relations for computing properties as a function of temperature or composition.

MSTDB-TC thermodynamic information resides in files in the "Chemsage" .dat (ASC II) format for use with the FactSage® commercial package of thermodynamic codes and compatible with the open-source equilibrium code Thermochimica.
- Separate files are provided for chloride- and for fluoride-based systems.
- Changes by FactSage® developers have resulted in the need to provide files readable by FactSage® Ver. 8.0 or lower and FactSage® Ver. 8.1 or higher, as noted in the documentation that will accompany the database download.
- Additional files include those for tracing all data sources and a library of published phase diagrams together with companion *MSTDB-TC*-computed phase diagrams to allow the user to compare model results with those previously reported.

MSTDB-TP contains sets of referenced values and relations for thermophysical properties including density, thermal conductivity, viscosity, heat capacity, and related optical properties. The database is maintained as a csv file of the salt systems thermophysical property data, uncertainty (when available), and literature references.

Accessing MSTDB: The databases and associated documents are hosted on a publicly accessible, permission-protected server at Oak Ridge National Laboratory (ORNL): https://code.ornl.gov/neams/mstdb/. Access requires an ORNL XCAMS account and an MSTDB membership, which once granted will allow downloading of all files.

- XCAMS account creation
    - Go to https://xcams.ornl.gov
    - Select "I need an account."
    - Read and acknowledge the User Agreement
    - Enter your email address and username following the guidelines on the page.
    - Enter "Personal Information" and "Contact Information" per the guidelines
    - Create an XCAMS password according to the guidelines provided on the page.
    - On the final step, note the activation sequence box at mid-page. Wait until each action item turns green and the box heading reads "Transactions Complete"
    - Log into https://code.ornl.gov using your new XCAMS username and password

- Request MSTDB membership
  - Send an email to mstdb@ornl.gov with "MSTDB Access Request" as subject
  - Include your XCAMS ID and brief summary of the purpose for your request

MSTDB-TC is a copyrighted database available license-free, and cannot be sold all or in part. Development is supported by the U.S. Department of Energy, Office of Nuclear Energy Molten Salt Reactor Campaign, Nuclear Energy Advanced Modeling and Simulation Program, and Nuclear Energy University Programs. *MSTDB-TP* is a product of Department of Energy MSR-related research programs.

Contacts: *MSTDB-TC* Ted Besmann (besmann@sc.edu)
MSTDB-TP Dianne Ezell (bullnd@ornl.gov)