

CRYOGENIC DATA CENTER

RESUME' OF ACTIVITIES
AND SERVICES



NATIONAL BUREAU OF STANDARDS
INSTITUTE FOR BASIC STANDARDS
BOULDER, COLORADO



DATA COMPILATION ACTIVITIES

The Cryogenic Data Compilation Unit is engaged in the critical evaluation and compilation of data on the properties (thermodynamic, transport, and other thermophysical properties) for the principal fluids (and common mixtures of these fluids) used at low temperatures; namely:

Helium	Nitrogen	Carbon Monoxide	Methane
Hydrogen	Oxygen	Fluorine	Xenon
Neon	Air	Argon	Krypton

The scope of the compilation program also includes the properties of metallic elements, selected alloys, and element dielectrics as follows:

Electrical Resistivity	Thermal Conductivity	Specific Heat
Dielectric Constant	Thermal Expansion	Enthalpy

Ultimately it is expected that data will be compiled for the mechanical properties of structural materials; however, it may be some time yet before tasks are started.

The thermodynamic properties of fluids being pursued are:

Pressure-Volume-Temperature
Vapor Pressure, Latent Heat, Saturation Densities
Isothermal Compressibility, Volume Expansivity
Entropy, Enthalpy, Internal Energy
Specific Heats (C_p , C_v , C_{sat})
Velocity of Sound

The transport properties of fluids included in the program are:

Thermal Conductivity	Prandtl Number	Thermal Diffusion
Viscosity	Diffusion Coefficients	Coefficients

Other thermophysical properties include:

Dielectric Constant	Electrical Resistivity	Magnetic Properties
Refractive Index	Surface Tension	Optical Properties
Dielectric Breakdown		

The literature is monitored on a continuing basis for all phases of the above program. As specific tasks are undertaken, comprehensive bibliographies are prepared and sometimes published. Task notebooks are made for preliminary selection of data and, where feasible, preliminary data sheets are issued. Critical evaluation is done by the senior staff consisting of two physicists, one engineer (thermodynamic), chemist, and physical chemist. The staff collaborates with theoretical groups within NBS and with consultants for better development of the theory where pertinent. The Data Compilation Unit operates as part of the National Standard Reference Data Program. The work is currently sponsored by the National Aeronautics and Space Administration.