

Open Data Source for Clathrate Hydrates

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In support of the Methane Hydrate Research and Development Act of 2000 and its reauthorization by the Energy Policy Act of 2005, the NIST TRC Group has developed and populated a database of thermophysical and crystallographic properties of clathrate hydrates from literature sources. This data source builds upon the experience gained from developing and maintaining the well-established SOURCE Data Archival system. A devoted Gas Hydrates Data Entry Facility was established for collecting literature sources and capturing data from those sources. Guided Data Capture software was developed to guarantee the integrity and completeness of digitized information. The Gas Hydrates Mark-up Language (GHML) originally developed by a CODATA task group was refined in conjunction with the development team to communicate data sets. Finally, extensions to the SOURCE property storage data structures were implemented. All these technologies were specifically designed with the numerical data and metadata sets pertinent to this project as targets. Of particular note, the wide range of complexity observed in relevant data sets, including clathrate hydrates of natural gases in marine environments, necessitated a new framework for thermophysical property storage. This framework can encode an arbitrary number of chemical components, phases observed and compositional distribution data while still respecting the information constraints of the Gibbs phase rule. This data source will be accessible on the World Wide Web on a free and open basis.