

Ionic liquids have become very popular in the last years, because of their unique properties, e.g. extremely low vapor pressure, wide electrochemical window, and promising selectivity/capacity. Therefore, they are discussed as "designer solvents" for the use in

- chemical reactions (e. g. biphasic reactions)
- as selective solvent for separation processes (extraction, absorption,)
- electrochemistry, etc.

For the development of new processes using ionic liquids besides the various pure component properties like

- viscosity
- density
- heat capacity
- heat of fusion
- melting point
- heat of transition
- thermal conductivity
- surface tension
- speed of sound
- electrical conductivity

in particular the knowledge of the phase equilibrium behavior as function of temperature, i. e.

- activity coefficients at infinite dilution
- vapor-liquid equilibria
- liquid-liquid equilibria (miscibility gaps)
- solid-liquid equilibria (melting points of mixtures)
- gas solubilities
- salt solubilities
- excess enthalpies
- excess heat capacities

with ionic liquids is required.

A few years ago nearly no data were available for systems with ionic liquids. But during the last years different research groups started to measure the required pure component properties and mixture data.

Published as well as unpublished data (private communications) are continuously stored in the Dortmund Data Bank (DDB). At the moment DDB contains pure component and mixture data for 3,300 ionic liquids:

Data Bank	Data Sets	Data Points
Activity coefficients at infinite dilution in ionic liquids	54,800	54,800
Vapor-liquid equilibria (binary and ternary VLE)	7,200	77,000
Gas solubilities (GLE)	2,100	10,800
Solid-liquid equilibria (SLE)	1,700	18,500
Liquid-liquid equilibria (LLE)	6,500	83,800
Excess enthalpies (HE)	390	6,250
Excess heat capacities (CPE)	650	8,900
Densities, volumes, excess volumes	5,600	62,900
Mixture viscosities	6,700	67,200
Mixture surface tensions	1,400	14,900
Mixture speed of sound	4,900	55,700
Electrical conductivity	3,750	47,100
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Pure Component Properties	12,400	95,400
Total	116,300	663,400

For building the data bank for ionic liquids approx. 7,200 publicly available sources (mainly scientific articles) have been evaluated. If the use of ionic liquids for a specific application is planned (e.g. as solvent for chemical reactions, selective entrainer for the various separation processes extraction, absorption or other applications) these data are extremely helpful. For the efficient use of the data, we recommend the use of the basic software package. This software package allows the data retrieval using several search options (components, systems, literature), has graphical data representations, copy and print capabilities, and allows data export to PPDx and Aspen™ INP files.

With the help of the software package new components can be defined and experimental data added to the data bank. At the same time the required basic data for the compounds, such as

- name and formula
- CAS registry number
- Antoine constants with the range of validity
- critical data and acentric factor
- density
- van der Waals properties
- melting point and heat of fusion
- dipole moment, etc.

are delivered. But because of the negligible vapor pressure, Antoine constants, critical data and acentric factors are available only for a limited number of ionic liquids.

Changes and errors are possible regarding all information and prices.