Ionic Liquids for Absorption and Separation of Gases: An Extensive Database and a Systematic Screening Method - DTU Orbit (22/12/2018)

Ionic liquids (ILs) have attracted considerable attention in both the academic and industrial communities for absorbing and separating gases. However, a data-rich and well-structured systematic database has not yet been established, and screening for highly efficient ILs meeting various requirements remains a challenging task. In this study, an extensive database of estimated Henry's law constants of twelve gases in more than ten thousand ILs at 313.15 K is established using the COSMO-RS method. Based on the database, a new systematic and efficient screening method for IL selection for the absorption and separation of gases subject to important target properties is proposed. Application of the database and the screening method is highlighted through case studies involving two important gases separation problems (CO₂ from CH₄ and C₂H₂ from C₂H₄). The results demonstrate the effectiveness of using the screening method together with the database to explore and screen novel ILs meeting specific requirements for the absorption and separation of gases.

General information
State: Published
Organisations: Department of Chemical and Biochemical Engineering, KT Consortium, Chinese Academy of Sciences
Contributors: Zhao, Y., Gani, R., Afzal, R. M., Zhang, X., Zhang, S.
Pages: 1353-1367
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: A I Ch E Journal
Volume: 63
Issue number: 4
ISSN (Print): 0001-1541
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 3.31 SJR 1.015 SNIP 1.331
Web of Science (2017): Impact factor 3.326
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.11 SJR 1.035 SNIP 1.29
Web of Science (2016): Impact factor 2.836
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 3.03 SJR 1.085 SNIP 1.428
Web of Science (2015): Impact factor 2.98
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 2.86 SJR 1.066 SNIP 1.337
Web of Science (2014): Impact factor 2.748
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 2.59 SJR 1.053 SNIP 1.355
Web of Science (2013): Impact factor 2.581
ISI indexed (2013): ISI indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 2.46 SJR 0.98 SNIP 1.437
Web of Science (2012): Impact factor 2.493
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 2.31 SJR 0.994 SNIP 1.248
Web of Science (2011): Impact factor 2.261
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 2
Scopus rating (2010): SJR 1.085 SNIP 1.404
Web of Science (2010): Impact factor 2.03
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 2
Scopus rating (2009): SJR 1.194 SNIP 1.437
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.282 SNIP 1.42
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.252 SNIP 1.337
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.486 SNIP 1.637
Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.308 SNIP 1.625
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.292 SNIP 1.659
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 1.688 SNIP 1.572
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 1.645 SNIP 1.72
Web of Science (2002): Indexed yes
Scopus rating (2001): SJR 2.114 SNIP 2.076
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 1.731 SNIP 1.752
Scopus rating (1999): SJR 1.517 SNIP 1.736
Original language: English
Keywords: Ionic liquids, COSMO-RS method, Database, Database, gases absorption and separation, Systematic screening method
DOIs:
10.1002/aic.15618
Source: FindIt
Source-ID: 2350226506
Research output: Research - peer-review ; Journal article – Annual report year: 2017