

Historical Perspective of the *Journal of Chemical & Engineering Data's* Published Topics, 1956–2020

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The Journal started in 1956 as *Industrial & Engineering Chemistry: Chemical & Engineering Data Series* with one issue per year. In 1959, it obtained its current name, *Journal of Chemical & Engineering Data (JCED)*, and changed to a quarterly publication frequency. Because of increased demand and interest, *JCED* turned to bimonthly publication in 1995, and has been published monthly since 2008. Since inception, *JCED* is primarily concerned with accurate, precise, and reproducible thermophysical data of unary, binary, ternary, and multicomponent systems obtained from experiment and, more recently, also from computation.

For the past 65 years, *JCED* adapted various topical areas to include contemporary research associated with the scope of the Journal and published special issues and virtual issues highlighting emerging and important topics of the ever-evolving field of thermophysical data.¹ From 1956 to 2020, *JCED* published a total of 17611 documents (Figure 1)

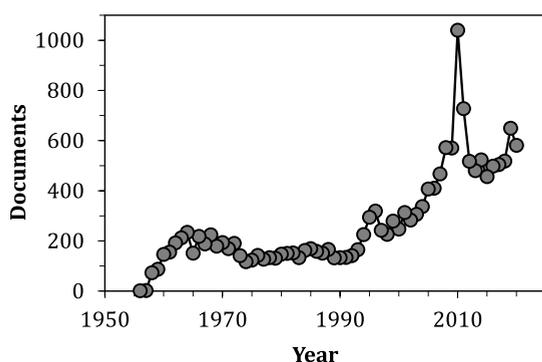


Figure 1. Number of documents published annually in *JCED*.

including 155 conference papers and 138 reviews. According to *SciVal* using All Science Journal Classification (ASJC) codes, *JCED* documents are classified into 267 topic clusters and 887 topics.² To analyze the topical areas featured in *JCED* publications, the Scopus Database has been used to extract all indexed keywords,³ and these are separated into three periods (1956–1980, 1981–2000, and 2001–2020) (Figure 2).

During the early period, the indexed keyword “Hydrocarbons” (assigned to about 65 documents) was the most frequent keyword followed by the words “Liquids”, “Thermodynamics”, “Alcohols”, “Methane”, “Solvents”, “Carbon Dioxide”, and “Phase Equilibria” to name a few. The indexed keywords “Mathematical Models” and “Correlation Methods”

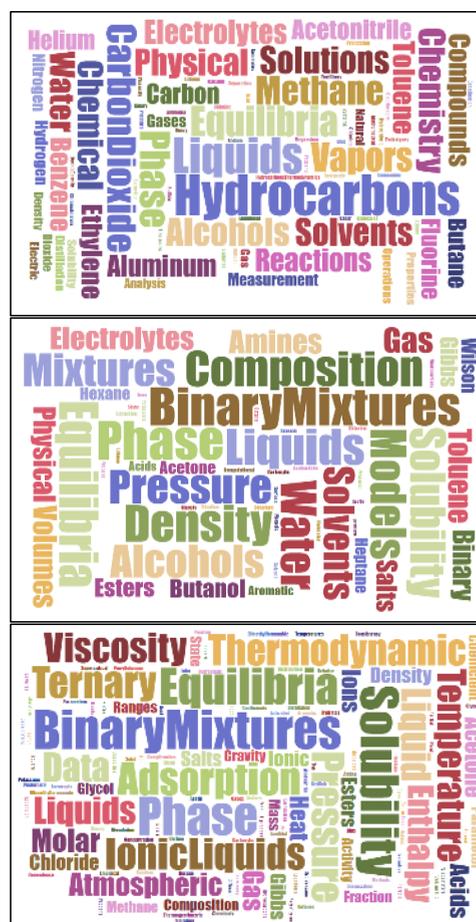


Figure 2. Word cloud representations of *JCED* keywords considering (top) 3675 documents published from 1956 to 1980; (middle) 3778 documents published from 1981 to 2000; and (bottom) 10158 documents published from 2001 to 2020.

saw a rapid rise from the early to the intermediate period. “Binary Mixtures” and “Phase Equilibria” are the top indexed

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keywords from 1981 to 2020. It is worth noting that indexed keywords such as “Ionic Liquids” and “Adsorption” which did not appear during 1956–2000, rose to prominence in the most recent period.

According to *Scival*, *JCED* documents published during the past decade predominantly comprised the following topics (in descending order of topic frequency): Gibbs equations, solubility, activity coefficients, ternary systems, ionic liquids, gas hydrates, phase equilibria, binary mixtures, electrolytes, equation of state, carbon dioxide, vapor pressure, and enthalpy.

Although the topics and indexed keywords are evolving, one of the outstanding features of articles and reviews published in *JCED* is that accurate, precise, and reproducible thermophysical data are of lasting value as indicated by their citations not diminishing after a short time period, but remaining about constant for a long time (Figure 3).

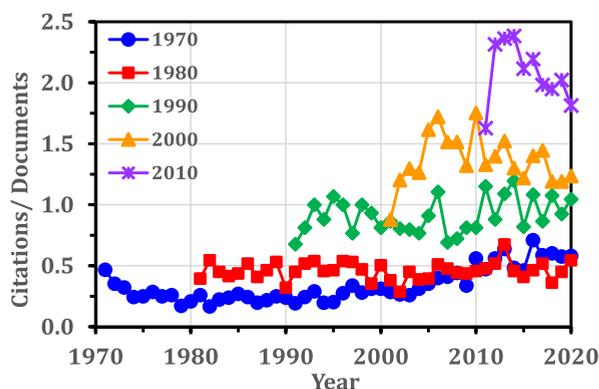


Figure 3. Number of citations per document published in a given year versus time.

We acknowledge all authors, reviewers, readers, and the contributions enabled through the cooperative agreement with NIST, for their significant role in extending *JCED*'s scope to novel and contemporary research topics. Their publications contribute to the advancement of the chemical sciences and chemical technology by providing high quality and reliable experimental and computational data.

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Notes

Views expressed in this editorial are those of the authors and not necessarily the views of the ACS.

REFERENCES

- (1) Brennecke, J. F. *Journal of Chemical & Engineering Data: Looking Back*. *J. Chem. Eng. Data* **2020**, *65* (12), 5628.
- (2) Topic is a collection of documents with a common focused intellectual interest. There are around 96000 topics in SciVal and each of the topics has been matched with one of the 1500 topic clusters.
- (3) Indexed keywords are keywords chosen by content suppliers and are standardized based on publicly available vocabularies. Unlike author keywords, the indexed keywords take into account synonyms, various spellings, and plurals.