



# **BIBLIOMETRIC ANALYSIS OF SCHOLARLY PUBLICATION: INVESTIGATING TRENDS, IMPACT, AND COLLABORATIVE NETWORKS IN CONTEMPORARY RESEARCH**

**Manisha Singh<sup>1\*</sup>**

## **Abstract**

Bibliometric analysis is an effective tool for investigating scholarly publication patterns, impact, and collaboration networks within specific fields of study. The present study will conduct a comprehensive bibliometric analysis of European chemical bulletin (ECB) including citation patterns, publication trends, most-cited papers, top authors contributing to the journal, coauthor ship networks, and co-citation analysis from 2017 to 2022. This assessment gives information on the journal's contribution in fostering advancements in modern chemistry research. Because VOS Viewer was integrated into our study, we were able to navigate and comprehend the data in a visually intuitive manner. As they navigate and contribute to this ever-changing sector, researchers and academicians will benefit from insights regarding research productivity, impact, and new trends.

**Key words:** Citation metrics, European chemical bulletin Bibliometric Analysis, VOS Viewer

---

<sup>1</sup>\*School of Management, UEM JAIPUR, E-mail:- manisha.singh@uem.edu.in

**\*Corresponding author:** - Manisha Singh

\*School of Management, UEM JAIPUR, E-mail:- manisha.singh@uem.edu.in

**DOI:** 10.48047/ecb/2023.12.si10.00496

## **Introduction.**

European Chemical of Bulletin is a well-regarded scholarly journal that covers a broad range of topics the field of chemistry. Since inception the journal has been consistently publishing high-quality research. Dr .K Krishna, the journal's founding editor, was instrumental in establishing "European Chemical Bulletin" (ECB) and influencing its development. The journal's editorial board is made up of eminent professionals in the subject, whose substantial contributions have helped to increase the journal's scholarly status and effect within the chemistry community. The journal, maintaining a continual flow of fresh research and insights for the scholarly community. The inclusion of the journal in major databases such as, Scopus, and others strengthens its presence and accessibility to scholars, offering a larger platform for distribution and improving the journal's potential effect within the subject of chemistry.

According to SC imago Journal Rank, the journal has an h-index of 11. This signifies that at least 11 articles published in the journal have gotten at least 11 citations from other authors, showing the journal's influence and intellectual impact. Furthermore, it is worth emphasizing that journal maintains stringent acceptance criteria to keep the publication's dedication to quality and ensuring that only high-quality research is published. The purpose of this research is to do a thorough bibliometric analysis of the journal " European Chemical Bulletin," (ECB). Similar analyses had been undertaken in the past for a number of journals, including the Journal of Fuzzy optimization and decision making (Yu, Dejian, et al., 2019.), Journal of Ecotourism (Singh et al., 2022), Journal of Transport and Supply Chain Management (Ittmann, 2021), Applied Mathematical Modelling (Verma, Rajkumar, et al.;2021), International Journal of Information Management (Donthu et al., 2021), and Journal of Symmetry (Li, Bo, et al.;2020), but no such study exists for "ECB." We are driven to fill this void by undertaking a thorough investigation in light of the current research gap. The current study tries to close this gap by conducting an exhaustive bibliometric analysis of "ECB." Our research will look at citation patterns, publication trends, and highly cited articles, noteworthy authors who have contributed to the journal, and network analysis among other things. The research will span the years 2019 through 2023, providing significant insights into the

intellectual landscape of "European Chemical of Bulletin."

This study undertakes network analyses using VOS Viewer and the freely available software R to examine the journal "ECB." The main objective is to conduct a comprehensive bibliometric analysis of the research published in the journal over last 5 years. The authors utilized the reliable Scopus database to gather relevant information for the study. The research aims to address the following key research questions:

- ❖ What are the observed publication trends and evolutionary patterns in the research articles published in "ECB" between 2017 and 2022?
- ❖ Who are the major authors, organizations and countries which contributed significantly to "ECB" between 2017 and 2022?
- ❖ Which specific articles in "ECB" have received the highest number of citations, signifying their impact and influence in the field?
- ❖ Which journals are frequently cited in conjunction with publications in "ECB," indicating their relevance and inter connectedness?

This study attempts to give a thorough overview of the research landscape within the journal by addressing these research issues. The insights will aid in a better understanding of the field's publication trends, key authors, citation impact, and collaborative networks. This analysis will give light on the journal's status and influence within the broader mathematical community, providing significant information for scholars, writers, and stakeholders.

## **Methodology**

Pritchard coined the word "bibliometrics" in 1969, he defined it as the use of statistical and mathematical methods to the assessment of books and other written works. Bibliometric analysis is a systematic and rigorous way to examining published research in order to get a thorough perspective and knowledge. It entails the use of a variety of methodologies that are specifically tailored to the aims and scope of the study. The data for this study's bibliometric analysis were gathered from Scopus, a well-known and extensive research database. According to Bartol et al. (2014) and Norris and Oppenheim (2007), it is widely recognized as a premier resource. Its popularity for research output was also highlighted by Durán-Sánchez et al. in 2019. The data was gathered in CSV format and then examined further.

To provide a comprehensive grasp of the subject matter, the study employs a combination of descriptive and network analyses. The findings section includes a descriptive analysis of key factors such as total number of publications, citations received, average number of citations per paper, citations per year, h-index, g-index, and m-index. The indicators given by Ding and Cronin (2011), Hirsch (2005), and Tsay (2009), present an in-depth analysis of the research's publishing and citation patterns. In addition, the study emphasizes network analysis, which include citation analysis, co-citation analysis, and bibliographic coupling. As proposed by Hota et al. (2020) and Park and Shea (2020), these methodologies enable a thorough study of the underlying intellectual structure within certain research areas. The bibliographic coupling method is especially useful for determining the degree of connectivity between two articles. The researchers use VOS Viewer, a software program developed by Van Eck and Waltman (2010, 2020), to enable these network studies, examine the strength of links, and visualize bibliometric interactions across diverse parts.

## Results

### Descriptive analysis

The area of bibliometric analysis has grown in prominence in recent years. Numerous criteria for

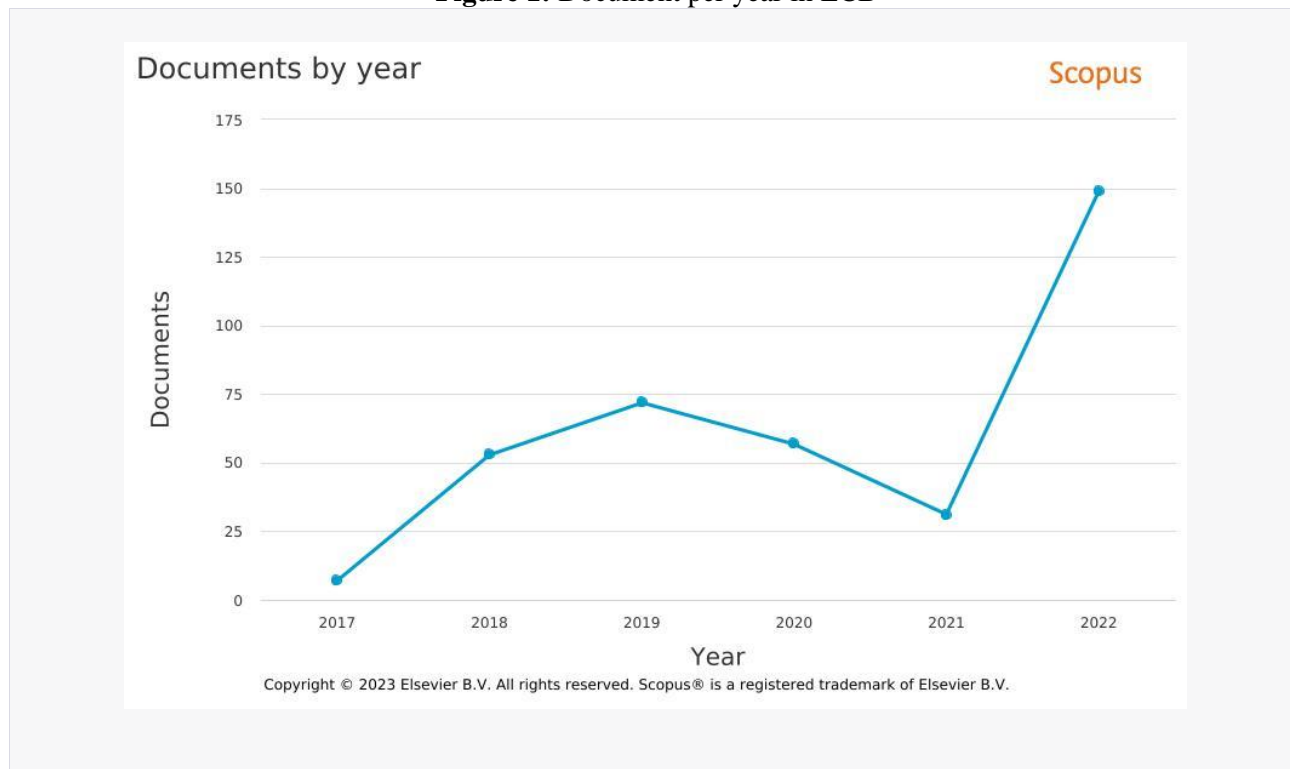
evaluating the quality of scholarly papers have been identified in the literature. The citation count is one such metric, which quantifies the frequency with which an article is cited by other authors. In this study, descriptive analyses are conducted prior to the analysis of quality criteria. These descriptive studies are focused on tracking the annual publication counts of papers in European Chemical of Bulletin. The publishing history reveals some fascinating tendencies. Figure 1 depicts the journal's inaugural issue, which had 7 papers and marked the journal's introduction into the scientific world. Since then, the journal has kept a steady tone. Since then, a consistent publication frequency, has been maintained by a journal with 57 articles published in 2020 except in year 2021 where there were only 31 publications. Notably, the year 2022 had the largest number of published papers, with a total of 149. This demonstrates a dedication to showcasing a varied spectrum of chemistry studies. The data in Figure 1 further shows that journal has effectively drawn a continuous supply of submissions, allowing for the publishing of many articles each year. The journal's commitment to quality is obvious in its rigorous blind peer-review procedure, which ensures that only high-quality research makes it into published issues.

**Table 1.** Citation structure of ECB (2017-2022)

Year	TP	TC	C/P	C/Y	h	g	m
2017	7	27	3.86	4.50	3	5	0.6
2018	53	125	2.36	25.00	5	7	0.71
2019	72	144	1.92	36.00	6	9	0.67
2020	57	364	6.39	121.33	11	14	0.78
2021	31	122	3.82	61.00	5	10	0.5
2022	149	83	0.56	83.00	4	7	0.57
Total	369	955	18.91	330.83	34	52	3.83

TP =total publications; TC =total citations; C/P= citation per paper; C/Y = citations per year; h= h-index; g= g-index; m =h/g.

**Figure 1:** Document per year in ECB



In addition, Table 1 offers a thorough description of the citation structure from 2017 to 2022. A deeper look at the table reveals that an outstanding 369 articles have garnered 955 citations, which include research papers and reviews. This demonstrates journal massive influence and recognition in the scholastic field.

Furthermore, the average number of citations per article from 2017 to 2022 is 18.91 indicating the level of importance and visibility of the published works. It's fascinating to observe that in terms of citations, year 2020 had the highest citations (364) followed by 2019 ( ).

Table 2 reveals a constellation of outstanding papers, illustrating the journal's scientific prowess and significance. Seven articles (2017) has

exceeded the astounding mark of 30 citations, demonstrating its ongoing value and tremendous influence in contemporary research. This, demonstrating their widespread readership and involvement within the academic community. These exceptional publications exemplify journal dedication to excellence as well as its essential role in creating the landscape of research in the field of chemistry.

**Table 2.** Top 5 most-cited articles from 2017 to 2022 in ECB

TC	TITLE	AUTHOR	YEAR	CPY
36	Synthesis and characterization of some distyryl derivatives for agricultural uses	S.A.A. Abdel-Raheem	2021	4
22	Activity of Pd-MnOx/cordierite (Mg,Fe) <sub>2</sub> Al <sub>4</sub> Si <sub>5</sub> O <sub>18</sub> catalyst for carbon monoxide oxidation	V. Bakhtadze	2020	7.33
19	Structural and magnetic properties of mgfe <sub>2</sub> o <sub>4</sub> ferrite nanoparticles synthesis through auto combustion technique	H.B. Desai	2021	2.33
19	Occurrence of microplastics in surface sediments of beaches in Lagos, Nigeria	I. Ilechukwu	2019	1.50
18	Characterization of bio fabrication copper (ii) oxide nanoparticles and investigate the photocatalytic efficiency.	D. Domyati	2022	18

CPY= Citations per year; TC= total citations.

**Table 3.** Top 5 authors contributing to ECB during the study period 2017-2022.

Author	Affiliated institution	TP	TC	C/P	h	g	m
Pawar, Rajendra Pundalikrao	Shiv Chhatrapati College, Aurangabad, India	17	103	5.72	6	9	0.67
Azab, A.	Carobway Ltd., Nes Ziona, Israel	9	26	2.89	3	4	0.75
Kótai, L.	Info Deuton-X Ltd., Érd, Hungary	9	68	6.80	6	8	0.75
Pansare, D.N.	Deogiri College, Aurangabad, Aurangabad,	9	51	4.64	4	6	0.67
Anishchenko, A.A.	Oles Honchar Dnipro National University, Dnipro, Ukraine	7	41	5.86	5	6	0.83

C/P =average citation per paper

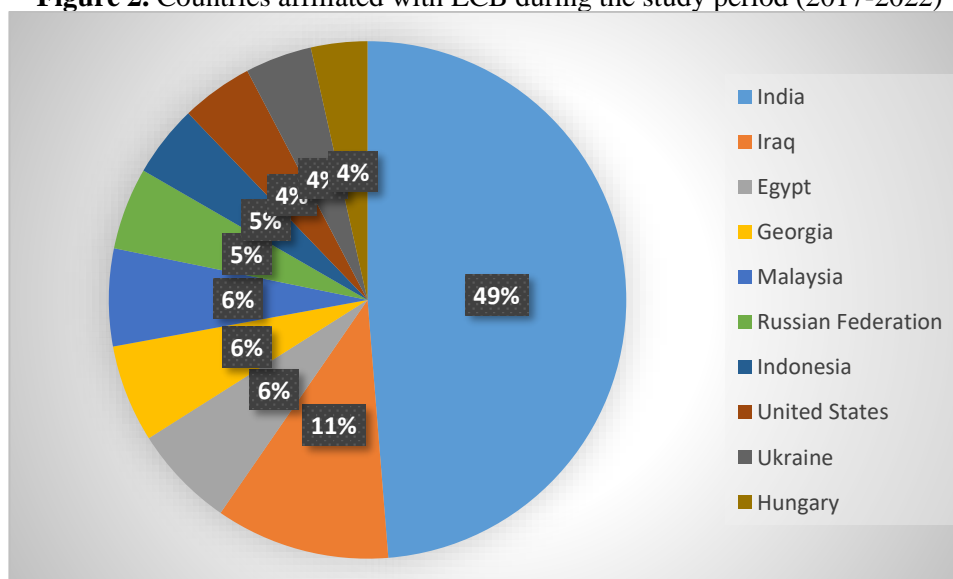
From 2019 to 2023, Table 3 lists the top authors who have contributed to ECB. According to the Scopus data base Pawar R.P is the top contributor in the journal over the period of time with 17 publications, generating 103 citations and a citations per year score of 5.72. Followed by Kotai L., Azab, A, Pansare, D.N. all contributed 9 articles in a journal but Kotai L is exceptional with 68 citations.

**Table 4.** Institutes associated with ECB.

Institute	TP	TC	C/P	h
Saveetha Dental College And Hospitals	30	1	0.05	1
Saveetha Institute of Medical and Technical Sciences	29	5	0.20	1
Deogiri College, Aurangabad	25	127	4.88	7
Ivane Javakhishvili Tbilisi State University	19	16	2.29	2
University of Cyberjaya	16	2	0.13	1

Table 4 shows the institutes that published in ECB during the research period. Saveetha Dental College and Hospitals have the highest number of publications (30 ) followed by Saveetha Institute of Medical and Technical Sciences with 29 publications. But when it comes to the citations Deogiri College, Aurangabad is the leading institute with 127 citations for 25 articles.

**Figure 2.** Countries affiliated with ECB during the study period (2017-2022)



A graphic representation of the different nations represented by authors that contribute to ECB publications is shown in Figure 2 .Notably, ECB publishes authors from an astounding 52 different Eur. Chem. Bull. 2023, 12(Special Issue 10), 4319 – 4328

nations, underscoring its global scope. With an astonishing 52 associations, India emerges as the most prominent country with 152 publications. Followed by Iraq and with 34 and 20 publications

each. It is also worth noting that India make considerable contribution, contributing a significant number of papers to ECB

**Table 5.** List of most cited ECB (2017-2022)

Source	Citation	Total Link Strength	SJR
Journal of Oral Biology and Craniofacial Research	6	72	0.475
Journal of Advanced Pharmaceutical Technology & Research	7	72	0.357
Journal of Public Health Dentistry	6	72	0.421
Contemporary Clinical Dentistry	6	72	0.269
Indian Journal of Dental Research	6	72	0.264

The academic journals cited in ECB from 2017 to 2022 are listed in Table 5. Strikingly, each journal exhibits an identical citation count of 6.

A journal's scientific significance and prestige are gauged by the SJR (SC imago Journal Rank). It considers both the quantity of citations a publication receives and the caliber of the journals that cite it.

According to the SJR Journal of Oral Biology and Craniofacial Research have a SJR score of 0.475 followed by Journal of Public Health Dentistry with a score of 0.421, indicating their high scientific impact and influence.

**Table 6.** List of top 5 journals citing ECB articles (2019–2023).

Journal	SJR	h index
Current Chemistry Letters	0.29	13
Marine Pollution Bulletin	1.49	210
Arabian Journal of Chemistry	0.85	100
Journal of Magnetism and Magnetic Materials	0.549	187
Science of the Total Environment	1.946	317

The top journals that cited publications from ECB between 2017 to 2022 are shown in Table 6. The major publications that cite ECB articles are Current Chemistry Letters and Marine Pollution Bulletin with SJR score of 0.29 and 0.85 respectively. Moreover Table 6 provides additional proof of ECB's high-quality standards by highlighting journals that have obtained high h index. Table reflects the 4 journals included in the table have a h index of more than 100, signifying their excellent quality and great influence in their respective fields. The inclusion of prestigious journals in Table 6 reaffirms the recognition and credibility of ECBs within the academic community.as it is cited by top-tier journals with recognized scholarly impact, as indicated by the SJR score.

#### **Bibliographic coupling of ECB articles**

According to Kessler (1963a), bibliographic coupling occurs when two documents cite the same third document. It is commonly used to assess

document similarity (Small, 1973; Egghe and Rousseau, 2002; Cobo et al., 2011; Hjørland, 2013; Zupic and Cater, 2015; Aria and Cuccurullo, 2017).The VoS Viewer's analysis of bibliographic coupling gives a visual representation of the links and relationships among scholarly publications based on their citation patterns. The visual depiction of bibliographic coupling allows for a more in-depth understanding of the field's intellectual structure, information flow, and collaborative networks, allowing scholars to glean useful insights for future analysis and inquiry.

The bibliographic coupling of related documents within ECB publications over the research period is shown graphically in Figure 3 Notably, four cluster can be seen from the analysis. The coupling between is represented by the curve in the illustration. The intensity of these correlations suggests that these institutions shared similar intellectual sources, reflecting a tight link and collaboration in their research endeavors. Cluster 1

includes 4 items, and the research area is related to molars. Cluster 4 comprises 2 items and focus on attitude and risk habits of patients.

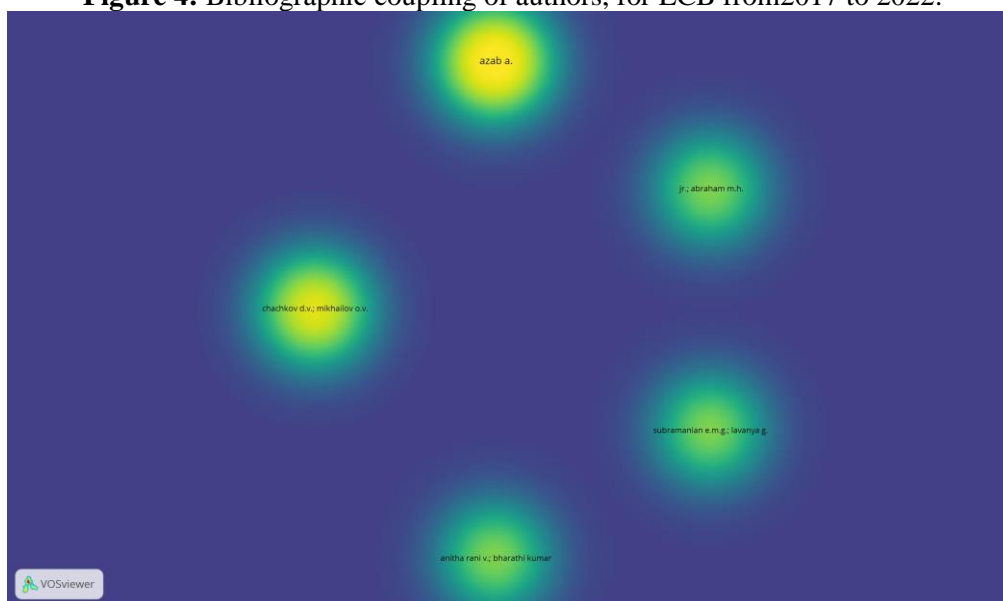
**Figure3:** Bibliographic coupling of documents, for ECB from 2017-2022

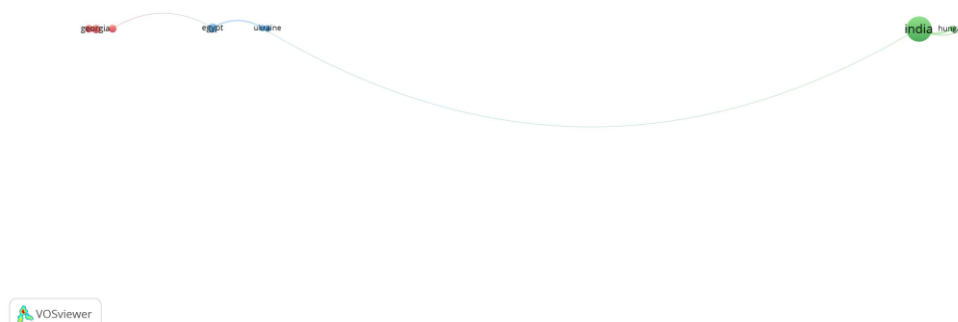


The bibliographic coupling among authors of ECB between 2017 to 2022 is shown graphically in Figure 4. It is possible to spot notable clusters of eminent authors, highlighting their research ties and geographical proximity. These clusters imply the establishment of bibliographic pairs inside ECB. The figure's curve strength indicates the high

degree of association and collaboration among notable coauthors like Chachkov, Denis V., and Oleg V. Mikhailov. exhibiting their close proximity within their individual research networks as demonstrated by the curves' strength.

**Figure 4:** Bibliographic coupling of authors, for ECB from 2017 to 2022.





**Figure 5.** Bibliographic coupling of affiliated countries in ECB (2017-2022)

Figure 5 depicts the bibliographic coupling analysis based on countries, with a minimum of five papers. The results show the existence of three separate clusters. The strongest bibliographic pair identified is that between China, Iran and Italy, followed by Brazil and France. Another important bibliographic partnership is formed by the India and United States. These findings highlight the need of strong research cooperation and knowledge sharing among countries.

### Discussion and Conclusions

ECB indexed in Scopus in 2017, with 7 articles. The journal has grown significantly in terms of citations and readership since its establishment, establishing itself as a premier publication in the field of chemistry research.

ECB's most productive year in terms of publication production was 2022, with 149 publications. on the other hand, 2020 was the most influential year, with 364 citations. S.A.A. Abdel-Raheem (2021)" Synthesis and characterization of some distyryl derivatives for agricultural uses" is the most cited article in ECB with 36 citations.

The most articles published in ECB from 2017 to 2022 were written by Pawar, Rajendra Pundalikrao. **who** have made major (17 articles) contributions. The most commonly affiliated institutes with ECB publications are Saveetha Dental College And Hospitals and Saveetha Institute of Medical and Technical Sciences. Furthermore, among countries, Indian ranks the highest, followed by the Iraq and Egypt in terms of contribution to ECB.

Bibliographic coupling analysis reveals the presence of spatial proximities among the intellectual output of authors, affiliated institutions and countries, This suggests a strong link and relationship between their research efforts within the scholarly landscape.

This paper attempts to makes a significant contribution to the body of knowledge on bibliometric analysis by providing a thorough and in-depth investigation of the intellectual structure of ECB. The data reported in the paper provide valuable insights for researchers, writers, affiliated institutions, and countries contributed in the Journal.

By conducting this study, researchers are given the opportunity to gain a more sophisticated grasp of their distinctive contributions and place within the evolving area of chemistry. It provides researchers with a holistic view of the impact of their research and allows them to identify how their work aligns with and influences the larger landscape of chemistry field. With this information at hand, researchers are prepared to choose their research trajectory wisely, build significant partnerships, and manage their professional development within the constantly changing field of chemistry.

### References

1. Abdel-Raheem, Shaban AA, et al. "Synthesis and characterization of some distyryl derivatives for agricultural uses." *European Chemical Bulletin* 10.1 (2021): 35-38.
2. Aria, M. & Cuccurullo, C. (2017). *bibliometrix: an R-tool for comprehensive science mapping*



- analysis. *Journal of Informetrics*, 11(4), 959-975. <https://doi.org/10.1016/j.joi.2017.08.007>
3. Bakhtadze, V., et al. "Activity of Pd-MnOx/CORDIERITE (Mg, Fe) 2Al4Si5O18 catalyst for carbon monoxide oxidation." *European Chemical Bulletin* 9.2 (2020): 75-77.
  4. Bartol, T., Budimir, G., Dekleva-Smrekar, D., Pusnik, M., & Juznic, P. (2014). Assessment of research fields in Scopus and Web of Science in the view of national research evaluation in Slovenia. *Scientometrics*, 98(2), 1491–1504. <https://doi.org/10.1007/s11192-013-1148-8>
  5. Cobo, M. J., López-Herrera, A. G., Herrera-Viedma, E. & Herrera, F. (2011). Science mapping software tools: review, analysis, and cooperative study among tools. *Journal of the American Society for Information Science and Technology*, 62(7), 1382-1402. <https://doi.org/10.1002/asi.21525>
  6. Desai, Harshal B., Arun Kumar, and Ashish R. Tanna. "Structural and magnetic properties of MgFe2O4 ferrite nanoparticles synthesis through auto combustion technique." *Eur. Chem. Bull* 10.3 (2021): 186-190.
  7. Ding, Y., & Cronin, B. (2011). Popular and/or prestigious? Measures of scholarly esteem. *Information processing & management*, 47(1), 80–96
  8. Domyati, Doaa. "Characterization of biofabrication copper (II) oxide nanoparticles and investigate the photocatalytic efficiency." *Eur. Chem. Bull.* 11.2 (2022): 1-6.
  9. Donthu, Naveen, et al. "Forty years of the International Journal of Information Management: A bibliometric analysis." *International Journal of Information Management* 57 (2021): 102307.
  10. Duran-Sanchez, A., del Rio-Rama, M., de la, C., Alvarez-Garcia, J., & Garcia-Velez, D. F. (2019). Mapping of scientific coverage on education for Entrepreneurship in Higher Education. *Journal of Enterprising Communities: People and Places in the Global Economy*, 13(1/2), 84–104. <https://doi.org/10.1108/JEC-10-2018-0072>
  11. Egghe, L. & Rousseau, R. (2002). Co-citation, bibliographic coupling and a characterization of lattice citation networks. *Scientometrics*, 55(3), 349-361. <https://doi.org/10.1023/a:1020458612014>
  12. Hirsch, J. E. (2005). An index to quantify an individual's scientific research output. *Proceedings of the National Academy of Sciences*, 102(46), 16569–16572.
  13. Hjørland, B. (2013). Citation analysis: a social and dynamic approach to knowledge organization. *Information Processing & Management*, 49(6), 1313-1325. <https://doi.org/10.1016/j.ipm.2013.07.001>
  14. Hota, P. K., Subramanian, B., & Narayanamurthy, G. (2020). Mapping the intellectual structure of social entrepreneurship research: A citation/co-citation analysis. *Journal of Business Ethics*, 166(1), 89–114. <https://doi.org/10.1007/s10551-019-04129-4>
  15. Ilchukwu, Ifenna, et al. "Occurrence of microplastics in surface sediments of beaches in Lagos, Nigeria." *European Chemical Bulletin* 8.11 (2019): 371-375.
  16. Ittmann, Hans W. "A bibliometric analysis of the Journal of Transport and Supply Chain Management." *Journal of Transport and Supply Chain Management* 15 (2021): 15.
  17. Kessler, M. M. (1963b). Bibliographic coupling extended in time: ten case histories. *Information Storage and Retrieval*, 1(4), 169-187. [https://doi.org/10.1016/0020-0271\(63\)90016-0](https://doi.org/10.1016/0020-0271(63)90016-0)
  18. Li, Bo, et al. "A bibliometric analysis of symmetry (2009–2019)." *Symmetry* 12.8 (2020): 1304.
  19. Maggon, Mohita. "A bibliometric analysis of Journal of Relationship Marketing (2002–2019)." *Journal of Relationship Marketing* 21.4 (2022): 324-351.
  20. Noeiaghdam, Samad. "Numerical approximation of modified non-linear SIR model of computer viruses." *arXiv preprint arXiv:1901.10804* (2019).
  21. Norris, M., & Oppenheim, C. (2007). Comparing alternatives to the Web of Science for coverage of the social sciences' literature. *Journal of Informetrics*, 1(2), 161–169. <https://doi.org/10.1016/j.joi.2006.12.001>
  22. Park, H., & Shea, P. (2020). A review of ten-year research through co-citation analysis: Online learning, distance learning, and blended learning. *Online Learning*, 24(2), 225–244. <https://doi.org/10.24059/olj.v24i2.2001>
  23. Pritchard, A. L. A. N. (1969). Statistical bibliography or bibliometrics? *Journal of Documentation*, 25(4), 344–349. <https://doi.org/10.1108/eb026482>
  24. Singh, Ranjit, P. S. Sibi, and Primula Sharma. "Journal of ecotourism: a bibliometric analysis." *Journal of Ecotourism* 21.1 (2022): 37-53.
  25. Small, H. (1973). Co-citation in the scientific literature: a new measure of relationship

- between two documents. *Journal of the American Society for Information Science*, 24(4), 265-269. <https://doi.org/10.1002/asi.4630240406>
26. Tsay, M. Y. (2009). Citation analysis of Ted Nelson's works and his influence on hypertext concept. *Scientometrics*, 79(3), 451–472.
27. van Eck, N. J., & Waltman, L. (2010). Software survey: VOSviewer, a computer program for bibliometric mapping. *Scientometrics*, 84(2), 523–538. <https://doi.org/10.1007/s11192-009-0146-3>
28. van Eck, N. J., & Waltman, L. (2020). VOSviewer manual version 1.6.16. Univeriteit Leiden.
29. Verma, Rajkumar, et al. "Forty years of applied mathematical modelling: A bibliometric study." *Applied Mathematical Modelling* 89 (2021): 1177-1197.
30. Zupic, I. & Čater, T. (2015). Bibliometric methods in management and organization. *Organizational Research Methods*, 18(3), 429-472.  
<https://doi.org/10.1177/1094428114562629>  
<https://www.scimagojr.com/>  
<https://www.scopus.com/>