

# Global Flow of Scholarly Publishing and Open Access

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Open Access is not a new topic for *Elements*. The topic was addressed by Alex Speer, Kevin Murphy and Sharon Tahirkheli in 2013 (Speer et al. 2013) and later by Christian Chopin in 2018 (Chopin 2018). I fully agree, there is a strong imperative for the geochemistry, mineralogy, and petrology communities to ensure that the research it produces is widely accessible, especially now in the increasingly important context of the United Nations Sustainable Development Goals. Indeed, according to the STM report 2018 (Johnson et al. 2018), two thirds of the scholarly literature in 2016 remains inaccessible because it is hidden behind a paywall to the public. Scholars have been making various cases for wider public access to published research, known as OA, since the late 1980s.

Scientific publishing is currently undergoing a major transformation with a move towards OA marking a major shift in major publishers' financial models, opening up greater diversity in publishing routes, and raising wider issues around publishing ethics. Ensuring that scientists and their institutions do not have to pay more to read and publish papers than they currently do has become critically important. The funder-led initiative Plan S, launched in September 2018, aimed at accelerating the full transition to OA, whose practices are now increasing at a systemic level. Currently, there are nine different routes for authors to achieve compliance with Plan S, only some of which have author-facing costs (Pourret et al. 2020). The funders behind Plan S will provide additional funding to researchers to cover related Article Processing Charge (APC) expenses, so authors should not face an increased financial burden. If authors are not directly supported by Coalition S, they have nothing to worry about because they are not forced to follow a policy that does not apply to them. Albeit, instead of the other potentially more sustainable and fair methods of achieving OA, Plan S seems to be directly financially biased towards covering APCs, based on ongoing trends around "transformative agreements" (Pourret et al. 2020). Plan S also entails changing the evaluation system, in particular, by promoting wider adoption of the San Francisco Declaration on Research Assessment (DORA) (<https://sfdora.org/>) and the Leiden Manifesto (Hicks et al. 2015). This coupling between changing both the publishing and evaluation systems should help to get over much of the slow growth and inertia towards more optimal scholarly communication systems.

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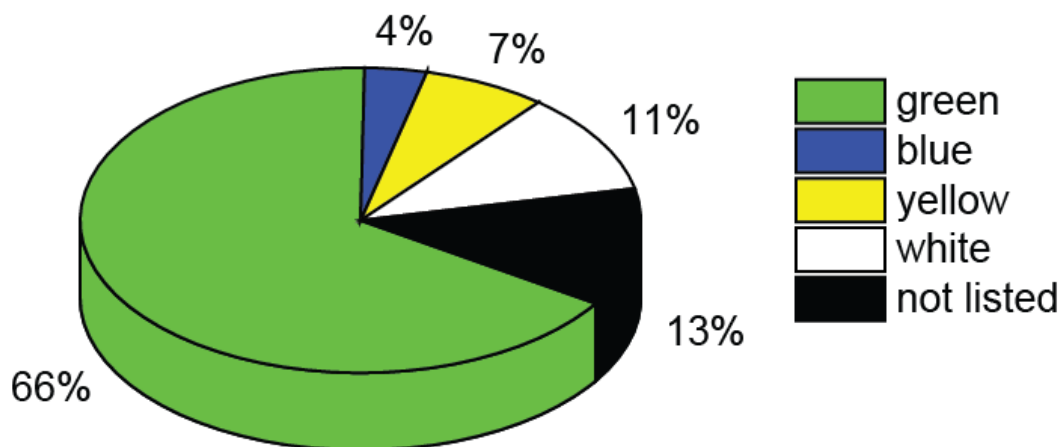
The capacity of journals and academic groups to transition effectively and sustainably to a dominant model of OA is currently under debate (e.g., <https://www.coalition-s.org/coalition-s-consults-on-transformative-journals/>). Like other scientific disciplines, geochemistry now has a number of publishing options available to authors provided by a variety of institutions, commercial publishers, and learned societies, creating a diverse publishing environment. It is even more imperative that individual research communities have a better understanding of the academic publishing landscape and reliable information on the options available to researchers as part of this transition. Many of our professional societies are currently evaluating their publishing strategies and economic models. A few are considering an increased role for OA publication in their journals. Pourret et al. (2019) provide an overview and analysis of the current OA practices in 56 “geochemistry” journals. They present an evaluation of the actual practices to encourage further dialogue, raise awareness, and support decision-making processes for the geochemistry community's future development. Journal publishing significantly changed as its dominance by learned societies was absorbed by multi-national commercial publishers (i.e., Elsevier, Springer Nature and Wiley), who make large profits from the intellectual property of researchers, who have “donated” their work to publishers in exchange for the potential ‘prestige’ that publication grants them in peer reviewed journals. Major changes are now becoming more mainstream, including widespread free access to articles (Piwowar et al. 2018) funded not by subscriptions but by an article processing charge (APC). This practice increases the profit-making capacity of commercial publishers and disadvantages authors with lesser financial privileges. More equitable alternatives are required, such as returning to the earlier model by which a research paper is not regarded as for-profit commodity, but a public-serving good. However, there is relatively simple and cost- and risk-free option: a majority of the journals in geochemistry (like *Elements*) have a green colour according to SHERPA/RoMEO (FIG. 1), indicating that preprint<sup>2</sup> and postprint<sup>3</sup> of articles submitted to journals can be archived on depository. According to *Web of Science* among the 885 articles published in *Elements* only 56 were OA as Gold or Bronze (data accessed on 01/02/2020). The change started these last three years with an increase of up to 31% total OA articles in 2018. This change was mainly because author’s institutions required authors to publish articles as OA, and paid for this.

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<sup>2</sup> version of a research paper typically shared prior to peer review and publication in a journal

<sup>3</sup> version of a research paper subsequent to peer review and, thus, acceptance, but before any type-setting or copy-editing by the publisher

### SHERPA/RoMEO colours of Geochemistry journals (n=56)



Green indicates that preprints and postprints can be archived, blue that postprints can be archived, yellow that preprints can be archived, and white that archiving is not formally supported.

**FIGURE 1** SHERPA/RoMEO colours of geochemistry journals. MODIFIED FROM POURRET ET AL. (2019).

As recalled by Pourret et al. (2020), OA is too often conflated with just one way to achieve it: the author-facing business model of APC, whereby authors (or their respective organizations or research funding agencies) pay an APC to cover the cost of publishing.

*“I can’t afford to pay fees to make my work Open Access!” Anonymous colleagues*

However, to reach OA, there are a variety of routes. Typically, these are identified by Gold, Bronze, Green or Diamond/Platinum; the latter two have no APCs. Green OA refers to the self-archiving on a personal website or archive of a near-final and peer-reviewed version of their work (usually the approved manuscript or postprint before any type-setting or copy-editing by the publisher). Due to better long-term preservation, publishing in a trusted archive is usually preferable. Diamond/Platinum OA refers to the free distribution of content on a journal website without any APCs being paid, with the running costs for the journals usually being covered by external means. Gold OA also requires additional APCs to be paid for immediate publishing access (i.e., all APC-based OA is gold OA, but not all Gold OA is APC-based). Bronze OA applies to free-to-read papers on the website of the publisher, but without any formal open license (e.g., CC BY) that could hinder their potential reuse. The highest APCs are typically those leveraged by the large commercial publishers (Pourret et al. 2019). But what’s the real cost of publication? Around US\$500 to \$600 like estimated by Grossmann and Brembs (2019)? When APCs are often much

higher, we need to ask what is the money being used for. Real for-profit or redistribution (fee waivers for low-income countries, student grants...)?

While science publication continues to move from the paywalled model to OA, it is possible that individual researchers will continually face problems with the APC scheme, irrespective of any future waiver or discount systems in place. Therefore, OA's APC-driven elements typically restrict the available journal option for those individuals who want or need to publish OA papers but have limited funding. In many cases, publishing their work in a high-impact journal without paying the APC and putting their paper behind a paywall is one of the only choices. It results in a complex system around OA. This scheme tends to spread across the research community into two classes of those who can afford to publish in OA journals, and particularly those who charge high APCs, and those who do not benefit from such financial resources and are forced to publish behind the paywall. For future research, it would be important to explore the effect that APC-related restrictions have had on researchers' publication choices across different disciplines, and in particular, the potential impact this may have on geochemical research's visibility and reuse.

Finally, in parallel to traditional journal publication, there is a clear role for self-archiving of peer-reviewed accepted manuscripts (postprint), the Green route. In addition, the policy of making research available to the wider public in some countries has essentially set up institutional repositories to do this (e.g., HAL in France). The Green route is cost-free for authors and numerous platforms, and collaborative tools for preprints (e.g., EarthArXiv) are available for researchers to pursue Green OA. However, the preprint model remains little known and not really used in geochemistry. Another problem is that the current APC model has additional restrictions on the publication of research from developing countries where OA fees are beyond reach, resulting in authors seeking out the lower- or no-cost options found in "predatory journals." Unfortunately, there are ample opportunities to publish scientific research as OA papers in "predatory journals", which lack the support from academic societies, uses unvalidated review processes, and have a for-profit approach with little clear consideration of what is written. Such publishing practices challenge the peer review's long-term future and publishing ethics. There is actually a good level of discussion between professional and learned societies and academic publishers on this subject (e.g., Society Publishers Accelerating Open access and Plan S (SPA-OPS) project; Wise and Estelle, 2019). I encourage the geochemical community to be active, consult and take action, prioritize our research with straightforward, open and rigorous peer review and visibility.

## **TAKE AWAY MESSAGE**

In the light of the rapid development of scientific publishing models, it seems important to draw attention to the situation of hybrid journals, including most of the conventional geochemical historical journals where we used to publish, like *Elements*. Plan S advocates full support for OA

papers, while excluding hybrid journals. This officially discourages researchers and institutions from paying additional fees in a subscription-based journal and asks us not to accept a double-dipping scheme. Publishing in a hybrid journal is indeed possible without paying for APC and disseminating the text on an open archives repository. The final published article will only be available to members on the journal's website, and the peer reviewed version will be free to everyone on the repository. The value of a journal is the community it creates, not just the papers it publishes. *Elements* is a good example! Continue to do great work, choose where you want to be published, but don't place it behind a paywall! Like me you can choose the Green route!



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## **COMPLEMENTARY READING**

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