GEOROC 2.0: A globally connected geochemical database to facilitate interdisciplinary, data-driven research

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The GEOROC database is one of the leading, open-access sources of geochemical and isotopic datasets that provides access to curated compilations of igneous and metamorphic rock and mineral compositions from >20,600 publications. It is an international data resource that supports hundreds of new research publications each year across multiple geoscientific and related disciplines (Chamberlain et al., 2021; Klöcking et al., 2023).
In this context, the Digital Geochemical Data Infrastructure (DIGIS) initiative is currently developing a new IT and data infrastructure for GEOROC 2.0 to facilitate modern solutions to data submission, discovery and access (Fig. 1). GEOROC data compilations are made accessible via a web search interface and trough a dedicated API. DIGIS also maintains a direct data pipeline of GEOROC compilation data to the EarthChem Portal (Fig. 2), which enables combined searches across six distinct geochemical databases. The DIGIS infrastructure further includes a domain repository for direct submission of geochemical datasets by the community (Fig. 2). This repository is hosted and curated in partnership with the GFZ Data Services of the GFZ (German Research Centre for Geosciences) in Potsdam. In addition, this repository can also be used for archiving citeable database versions.

Fig. 1: Setup and IT-environment of the GEOROC database

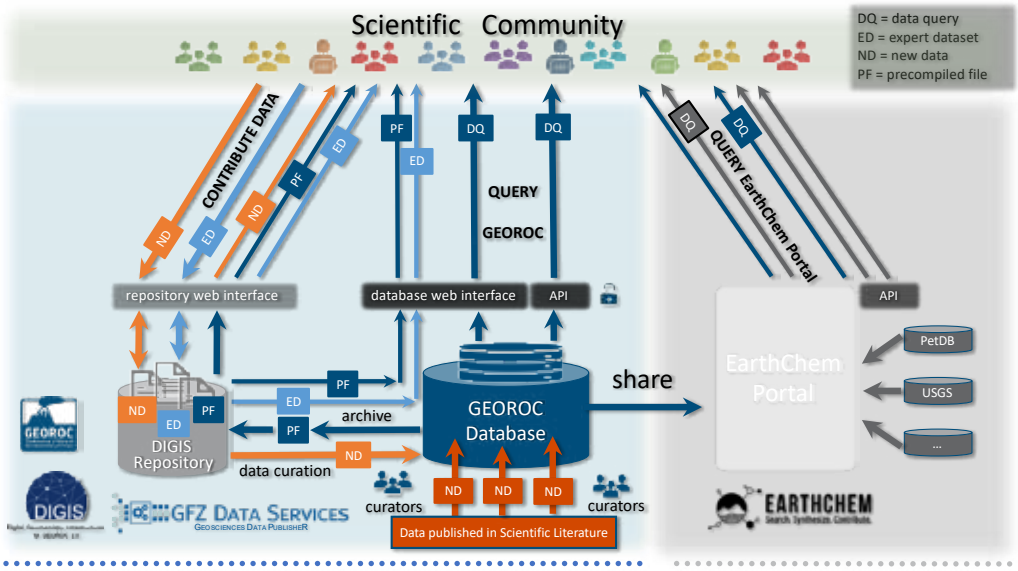

Fig. 2: The GEOROC data base and links to geochemical data services

In an effort to standardise geochemical data reporting, DIGIS collaborates with EarthChem, Astromat, and MetBase to develop common vocabularies that will enhance international interoperability of geo- and cosmochemical data systems. Part of this cooperation is the development of a joint, browser-based data entry tool for the GEOROC, PetDB and Astromat synthesis databases, which will avoid duplication of data and ensure consistent data and metadata quality through common curation policies. With these efforts, and as a participant of the "OneGeochemistry" initiative, DIGIS is working towards the goal of globally harmonised and FAIR geochemical data and support interdisciplinary, data-driven research.

Klöcking M, Wyborn L, Lehnert K, Ware B, Prent A, Profeta L, Kohlmann F et al. (2023): Community recommendations for geochemical data, services and analytical capabilities in the 21st century. - Geochimica et Cosmochimica Acta 351, 192-205, DOI: https://doi.org/10.1016/j.gca.2023.04.024

Chamberlain KJ, Lehnert KA, McIntosh IM, Morgan DJ, Wörner G (2021): Time to change the data culture in geochemistry. - Nat Rev Earth Environ (2021), https://doi.org/10.1038/s43017-021-00237-w