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Developments in AusGeochem: A platform for geochemical data storage, dissemination, visualisation and analysis

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In 2019, in response to a national expression of need for better organisation and coordination of geochemistry laboratories and increasing volumes of data, the AuScope Geochemistry Network (AGN) was established with a primary goal of developing and maintaining a FAIR (Findable, Accessible, Interoperable and Reusable) geochemistry data ecosystem capable of hosting a diverse suite of geochemistry and geochronology data (AusGeochem). AusGeochem seeks to address a key theme arising within the international geochemical community regarding the development of sound data infrastructure to cut through inefficiencies inherent in the data production, management, formatting and storage process.

The AGN and collaborator Lithodat have made significant progress building AusGeochem, which is now an operational open-access cloud-based platform allowing researchers to easily store, disseminate and interrogate a variety of geochemical and geochronological data. Importantly, AusGeochem also acts as an interface between the institutional, collaboration and public domains, allowing users from the public, industry and academia alike to jointly inspect data through secure access options.

AusGeochem has recently released a new capability focusing on, major, minor and trace element geochemical data at a range of analytical scales from whole-rock to in-situ mineral or single-grain analyses. With this new functionality, users can explore geochemical data produced by a variety of researchers and institutions using a number of flexible 'on-the-fly' plotting capabilities, such as versatile biplots and ternary diagrams, spiderplots, whole-rock geochemical discrimination plots and geochemical interpolation maps. These additions provide powerful tools for simultaneously interrogating geochemistry data obtained by a multitude of institutions from large data sets on regional to global scales. The implementation of the 'Paleogeographic Reconstruction Tool' is another significant advance as it allows users to interrogate large swathes of available geochemical data, in their paleographic context through deep time.

Although development is continuous, these recent upgrades demonstrate that AusGeochem has the potential to grow into a powerful multi-purpose geochemistry research tool which can act as a key resource in quantitatively understanding Earth system processes, utilising world-class data produced around the globe. AusGeochem is open to all and global users are encouraged to interact with the platform. Access here: https://ausgeochem.auscope.org.au/