

GeoTPD — an interactive online tool for geochemical modelling for the broad geological community

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Geochemical modelling programs and thermodynamic databases are widely used in the professional and academic *geochemical* community. Their uptake and efficient usage by larger *geological* circles is still limited either (1) by licensing restrictions and prohibitive costs of commercial packages or (2) by rather steep learning curves required for academic packages. Another critical problem is the high level of chemical literacy required for effective interpretation of the results.

Here we present GeoTPD, an interactive web application for geochemical modelling and database management. GeoTPD is built on the platform of two open-source R packages: CHNOSZ (Dick, 2008) and Shiny (RStudio). The application is developed with a three-fold purpose: as (1) a hub to exchange trackable thermodynamic data; (2) a simple model-examination tool for economic geologists and hydrogeochemists; (3) a teaching tool for demonstrating the main concepts of hydrogeochemistry.

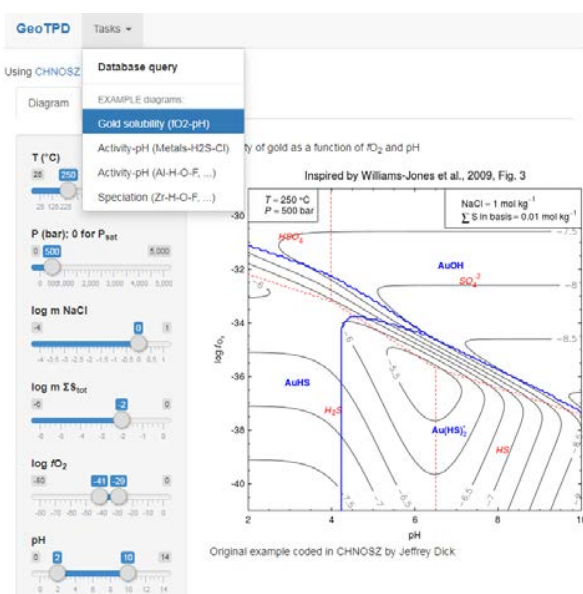


Figure 1: An example GeoTPD diagram dialogue page.

GeoTPD supports creation of common geochemical diagrams (redox-pH, activity-activity, solubility) within a wide range of crustal conditions (0 to 1000°C, 1 to 5000 bar) for pre-defined chemical system templates. It allows to readily illustrate in real time the impact of changes of intensive chemical variables (T , P , concentrations and activities of solution components) on speciation and solubilities of chemical elements. We demonstrate application of the system for understanding the hydrothermal transport of ore-forming elements (Ag, Au, Cu, Pb, Zn, Pt, and Pd) and invite feedback from attendees on desired functionality and usability enhancements in the teaching environment.