



## Graphical analysis of chemical and isotopic carbon data for groundwater dating

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Identifying geochemical reactions is essential in interpretation of radiocarbon age in groundwater systems. Here we describe a graphical method for analysis of chemical and isotopic carbon data which can help in identifying carbon geochemical reactions. The graphs depict the relationships between  $^{14}\text{C}$ ,  $^{13}\text{C}$ , and concentration of dissolved inorganic carbon and the data are interpreted according to specific criteria to recognize water samples that are consistent with a wide range of processes, including geochemical reactions, carbon isotopic exchange,  $^{14}\text{C}$  decay, and mixing of waters. The graphs can be used to provide a qualitative estimate of radiocarbon age, to deduce the hydrochemical complexity of a groundwater system, and to compare samples from different groundwater systems. The information derived from the graphs can be used to improve geochemical models for adjustment of radiocarbon ages in groundwater systems.