Clumping Lausanne

Contact persons

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Context

An exciting new development in stable isotope geochemistry over the past decade is the measurement of "isotopic clumping" in molecular CO_2 and in crystallized carbonate from which the CO_2 is extracted by acid digestion. This "clumping", which refers to the tendency of having the heavy but rare stable isotopes of carbon and oxygen occurring together in the same molecule of CO_2 relative to their stochastic abundance within the same phase, is thermodynamically favored (Eiler and Schauble, 2004). The measurement of isotopic clumping thus has the great advantage over conventional measurements of isotopic compositions of CO_2 in that it provides a single-mineral, thermodynamically based geothermometer. Given knowledge on the temperature of carbonate crystallization, the isotopic composition of fluids in equilibrium with the carbonate can then also be determined.

Objectives and Methods

1a. Clumped Isotope Research on Recent Environmental and Climatic Changes in the Lake Geneva Basin, Switzerland, and
1b. Chilika Lake, India
2. Clumped Isotope Research on Pedogenic Carbonates and Paleosols
3. Low-Grade Metamorphism of Carbonate-Bearing Rocks and Veins and Clumped Isotope Research: Questions of Closure Temperatures to Internal Solid-State Diffusion and Applications

Literature

Ghosh KA and Pattnaik AK. Chilika lagoon: experience and lessons learned in brief. http://www.iwlearn.net/publications/ll/chilikalagoon_2005.pdf.

Khandelwal A. et al. Vegetation history and sea level variations during the last glacial 13,500 years inferred from pollen record at Chilika Lake, Orissa, India Veget Hist Archaeobot, 17, 335-344 (2008).

Site WEB

www.chilika.com

www.unil.ch/idyst/en/home/menuinst/lab-facilities/stable-isotope-laboratory.html

Choice of orientation

Geochemistry, Isotopes, Climate and Paleoclimate, Water cycle, Sedimentology