Comparative Chemical Composition of Sediment Interstitial Waters

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Abstract: Interstitial waters squeezed from modern sediments with a 100 psi pressure at laboratory temperature (23 ° C are depleted in K and Ca and enriched in Mg when compared to the solutions obtained at *in situ* temperature (28 ° C. The changes are especially pronounced when the samples are refrigerated during transport back to the laboratory. The magnitude of the variation in chemical composition was dependent on the element being analyzed as well as the sediment used. The maximum observed depletion in the laboratory was about 12% per degree difference in temperature for potassium. Element ratios in the solutions were affected most seriously. The Mg/Ca and Na/K ratios increased 51 and 60% respectively.

A water extraction method using sediment to water ratios of 1:2, 1:5, and 1:10 was compared with the pressure method. The total composition of the pore fluids obtained by squeezing is greater than expected, corresponding to a sediment to water ratio less than 1:5. The artificially squeezed sediments are yielding pore fluids which are more concentrated than the " in-place " solutions.

The water extraction method yields results which are in agreement with the behavior predicted by the Donnan Principle. It is suggested that the values obtained by successive dilution analyses can be extrapolated to measured moisture contents and used to determine the elemental composition and element ratios in interstitial pore fluids.

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