Strontium (Sr) Isotope Stratigraphy of the Upper Jurassic Arab and Asab Formations, U.A.E

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A pilot study was undertaken to assess the viability of using whole-rock strontium isotope ratios as a means to verify the established sequence stratigraphic framework for the Arab and Asab formations of the United Arab Emirates. Several key observations were made during the course of the strontium (Sr) isotope study. Firstly, results revealed that the method produced usable data regardless of sample lithology (i.e. limestone vs. dolomite vs. anhydrite). Secondly, in contrast to a previous study, a time-related isotopic trend and signature is apparent in the studied Jurassic carbonates and anhydrites. Thirdly, a correspondence exists between the calculated ages of the rocks and the established 3rd-order sequence stratigraphy framework, thereby validating the overall correlation. However, higher 4th-order and 5th-order cyclicities in the units may be below the resolution of the technique. Fourthly, the strontium isotope ratios unambiguously identify the transition from the underlying Asab Formation and the overlying Habshan Formation. Lastly, although, 4th- and 5th-order cycles pose problems for direct age dating correlations, whole-rock strontium isotope ratio data excursions and overall trends have excellent potential as correlation tools. Many researchers have disregarded the use of the whole-rock strontium data as containing too many 'hidden' problems but potentially this study indicates that given geologically and petrographically constrained samples, from rocks of certain ages, very viable data may be yielded using this method.