

Seawater $^{87}\text{Sr}/^{86}\text{Sr}$ Curve for the Proterozoic: State of Art

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Reconstructions of the $^{87}\text{Sr}/^{86}\text{Sr}$ variations in Proterozoic seawater are based on the Sr isotopic analyses of the relatively least altered carbonate samples selected on the base of variable geochemical criteria and often having only broad age constraints. Fragmentary data for Paleoproterozoic and early Mesoproterozoic enable to make only rough estimates of the $^{87}\text{Sr}/^{86}\text{Sr}$ variations in coeval ocean. This ratio increased from 0.7033 to 0.7051 (Hamersley, Transvaal and Wyloo groups) at 2.5-2.2 Ga, reduced to 0.7034-0.7043 (Jatulian Supergroup) at 2.2-2.0 Ga, then rose from 0.7047 to 0.7065 (Coronation Supergroup, Pethei, Misstassini and McArthur groups) at 2.0-1.6 Ga and decreased to 0.7048-0.7051 (Belt Supergroup) and 0.70465 (Kyutingda Formation) at 1.5-1.3 Ga. The late Mesoproterozoic and Neoproterozoic seawater $^{87}\text{Sr}/^{86}\text{Sr}$ curve is based on much broader database. In the range of 1.10-1.03 Ga the $^{87}\text{Sr}/^{86}\text{Sr}$ ratio decreased from 0.7062 to 0.7056 and then to 0.7052 at 1.02 Ga (Kerpyl and lower Lakhandia groups and lower Turukhansk succession). As Uralian and North American data indicate, at 0.89-0.82 Ga, it increased from 0.7054 to 0.7057, then varied between 0.7054 and 0.7074 in the range of 0.80-0.65 Ga. The Vendian was marked by drastic rise from 0.7063 to 0.7087. Contradictions in the reconstruction of the $^{87}\text{Sr}/^{86}\text{Sr}$ curve for 0.80-0.65 Ga interval (upper Karatau, Shaler and Akademikerbreen groups) are related both to lack of precise age constraints of sampled successions and absence of unified methodological approach to screening and processing of carbonate samples. To overcome these difficulties, it is essential to: (1) obtain the reliable geochronological data for the above groups; (2) estimate environments of carbonate sedimentation; (3) use the rigid geochemical criteria for screening the "best" samples and (4) use the leaching technique to enrich the samples in primary carbonate phase. This work was supported by the RFBR Grant 99-05-65181.