

Sr-isotope stratigraphy of marble sequence in the Kazdağı Massif (NW, Turkey): An alternative dating method in high-grade metamorphic domains

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The metamorphic succession of the Kazdağı massif is one of the well-known high-grade metamorphic complexes in the northwestern Turkey. This metamorphic succession is characterized by typical oceanic crustal package below and an unconformably overlying platform sequence with mafic lava intercalations above. Medium-thick bedded, gray to white marbles dominate this platform sequence. In the lower parts of these marbles “Ammonitico rosso”-like facies, which has been defined in the Mesozoic sequence of the Sakarya Continent, are observed.

Here, we employ $87\text{Sr}/86\text{Sr}$ isotope trends in global seawater to estimate the deposition age of the marble sequence in the Kazdağı massif. Thirty-eight marble samples were analyzed for Sr-isotope with internally crosschecking the results by using 3 nonmetamorphic carbonate samples from stratigraphically well-known Karakaya Complex, NW Turkey. Overall, Norian to Plansbachian depositional age of 184-207 Ma. is evaluated from the Sr-isotope variations in the marble samples of the Kazdağı Massif. This Upper Triassic to Lower Jurassic ages from the marbles are also in agreement with previously reported detrital zircon ages from the metaplatfrom units of the Kazdağı massif.

Collectively, the results show that the metaplatfrom unit closely resembles the Mesozoic platform sequence of the Sakarya Zone, and contrary to the previous models, they are not part of a Paleozoic sequence that had undergone poly-metamorphic events.