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Petrography and element geochemistry of dolomites of Sibzar Formation, east of Neyshabur

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Abstract: The Sibzar Formation (Middle Devonian) is located about 30 km east of Neyshabur and is composed of lower dolostone with intercalations of sandstone, middle basaltic sill and upper dolostone to limy dolostone, with a thickness of 334 m. Based on the crystal size in this formation, three different types of dolomite (D_1, D_2, Vd) were identified and according to the textural classification of the dolomite, most of the dolomite are nonplanar-a (xenotopic mosaic), planar-s (hypidiotopic mosaic) and planar-e (idiotopic mosaic), respectively. The dolomite of Sibzar Formation have an average of 21.36% Ca, 10.9% Mg, in terms of the concentration of the major elements. The high concentrations of Fe (average 1835.48 ppm) and Mn (average 1824.62 ppm) indicate the reduction conditions during deep burial. The concentration of Na (average 1108 67/1 ppm) indicates the entry of hypersaline fluids into the environment. The average concentration of strontium is 455.41 ppm. The source of magnesium ions is Mg-rich sea waters, connate sea waters and migration of hydrothermal fluids. According to petrographic and geochemical evidence, D_1-type dolomite have been formed in tidal environment, D_2-type dolomites due to the aggrading neomorphism of D_1-type dolomite and Vd-type dolomites are formed during diagenetic processes.

Keywords: *dolomite; Sibzar Formation; Neyshabur; element geochemistry.*

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