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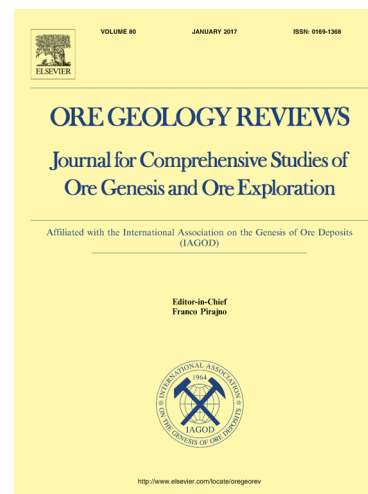
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Geological and geochemical constraints on the Cheshmeh-Frezi volcanogenic stratiform manganese deposit, Southwest Sabzevar basin, Iran

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Abstract

The Cheshmeh-Frezi Mn deposit belongs to the southwest Sabzevar basin to the north of the Central Iranian microcontinent. This basin, which hosts abundant mineral deposits including Mn exhalative and Besshi-type Cu-Zn volcanogenic massive sulfide deposits, followed an evolution closely related to the subduction of the Neo-Tethys oceanic crust beneath the Central Iranian microcontinent. Two major sedimentary sequences are recorded within this basin: (I) the Lower Late Cretaceous volcano-sedimentary sequence (LLCVSS) and (II) the Upper Late Cretaceous sedimentary dominated sequence (ULCSS). The Cheshmeh-Frezi Mn deposit is hosted within red tuff with interbeds of green tuffaceous sandstone of the LLCVSS. Mineralization occurs as stratiform blanket-like and tabular orebodies. Psilomelane, pyrolusite and braunite are the main minerals of the ore, which display a variety of textures. Such as layered, laminated, disseminated, massive, replacement or open space fillings. The footwall and hanging-wall volcanic rocks are predominantly andesite and trachyandesite rocks. Footwall and hangingwall volcanic rocks at Cheshmeh-Frezi are enriched in light rare earth elements (LREEs) compared to

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