

ABSTRACT



A petro-chronological framework for the Ordubad region, Azerbaijan, Lesser Caucasus – implications for regional metallogeny

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The Ordubad region in Southern Nakhchivan, Azerbaijan, is regarded prospective for metal deposits related to porphyry systems based on Soviet era exploration and recent more focussed exploration by Anglo Asian Mining. However, the lack of a modern regional geochronological framework has so far restricted the development of a full understanding of the mineral potential of the district. The district comprises intrusive rocks of the western Meghri-Ordubad plutonic complex and volcanic rocks of Cenozoic age. Regionally, Ordubad is part of the Zangezur-Ordubad mining district, which is a southern extension of the Lesser Caucasus covering the southern part of the Nakhchivan Autonomous Republic (Azerbaijan), southern Armenia and northern Iran. There is currently no active mining in Nakhchivan and active mines in the area are restricted to intrusion-hosted porphyry- and epithermal-style mineralisation in the Armenian side of Meghri-Ordubad plutonic complex and in Iran, with notable examples being the world-class Kadjaran deposit, and the Agarak, Sungun and Masjed Daghi porphyry-style deposits.

Most studies defining the geological framework of the Ordubad district date back to Soviet times with most recent studies on the Zangezur-Ordubad district and more specifically the Meghri-Ordubad pluton having focussed on Southern Armenia. Detailed geochemical and geochronological data (petrochronology)

resolved that the Meghri-Ordubad plutonic complex was assembled from the Eocene to Early Miocene in three magmatic epochs (Rezeau et al. 2016). Ore deposit formation occurred towards the end of each cycle with the largest deposits being associated with the culmination of the second cycle in the Oligocene.

This study presents new whole rock geochemistry and LA-ICP-MS zircon mineral chemistry and U-Pb geochronology data from plutonic, hypabyssal and volcanic rocks of the Ordubad region in Azerbaijan. The new data provides the first absolute U-Pb age constraints on the individual lithologies and places them into the temporal framework of Zangezur-Ordubad region. Based on comparison with extensive published data-sets (Moritz et al. 2016; Rezeau et al. 2016; Rezeau et al. 2019) our data further allow critical assessment for the potential of porphyry centres or epithermal plays hosted within the Meghri-Ordubad plutonic complex and the Cenozoic volcanic domains.

References

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Geomodels for HiTech materials in alkali-silicate & carbonatite systems

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Development of renewable energy infrastructure requires critical raw materials, such as REE and Nb, and is driving expansion and diversification in their

supply chains. Although alternative sources are being explored, the majority of the world's resources are found in alkaline silicate rocks and carbonatites

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