The geochronological comparison of three major porphyry systems in Timok magmatic complex: Bor, Veliki Krivelj and Čukaru Peki

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Дигитални репозиторијум Рударско-геолошког факултета Универзитета у Београду омогућава приступ издањима Факултета и радовима запослених доступним у слободном приступу. - Претрага репозиторијума доступна је на www.dr.rgf.bg.ac.rs The Digital repository of The University of Belgrade Faculty of Mining and Geology archives faculty publications available in open access, as well as the employees' publications. - The Repository is available at: www.dr.rgf.bg.ac.rs The geochronological comparison of three major porphyry systems in Timok magmatic complex: Bor, Veliki Krivelj and Čukaru Peki

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The Bor deposit is a world-class porphyry-high sulfidation system located in eastern Serbia. It has been mined since the very beginnings of the 20th century. Veliki Krivelj is a porphyry type Cu-Au deposit, currently mined by open-pit, located around 4 km north of Bor mine. Čukaru Peki is a recently discovered porphyry and high-sulfidation type Cu-Au deposit located 5 km south of Bor mine. All these mineral deposits are genetically associated with the first magmatic phase of the Timok magmatic complex.

Most of the performed U-Pb measurements of zircons from Bor (using LA-ICP-MS method) imply that the age of this system is around 86–84 Ma (von Quadt *et al.*, 2002; Kolb *et al.*, 2013). The recently obtained ages of the zircons from the Bor deposit (Klimentyeva, 2022) yield ages of mineralization between 84.5 ± 1.27 Ma and 83.25 ± 1.25 Ma.

Kolb (2011) have conducted U-Pb dating of zircons from Veliki Krivelj deposit and concluded that the mineralization age is in range from 86.12 ± 0.29 Ma to 84.4Ma ± 0.86 Ma.

The zircons from Čukaru Peki have concordia ages of 86.2 ± 2.6 Ma (mineralized diorites) and 84.95 ± 1.8 Ma (late non-mineralized dykes, Velojić, 2021).

All the presented data implies that the main mineralization stage in this magmatic complex occurred in the period of 87 Ma to 83 Ma, which is quite similar to the ages proposed by von Quadt *et al.* (2002). The obtained zircon ages of Čukaru Peki and Veliki Krivelj are very similar (between 86.2 Ma and 84.5 Ma), whereas the recently obtained U-Pb ages of Bor imply very similar ages (84.5 ± 1.27 Ma -83.25 ± 1.25 Ma). The measured ages overlap if maximum values of analytical uncertainties are considered.

The occurrence of two or more relatively adjacent porphyry systems with similar ages is common in other porphyry systems worldwide, such as Chuquicamata district (Chile) and Yanacocha district in Peru (Sillitoe, 2010). One explanation for age discrepancies of intrusions in porphyry districts, given by Sillitoe (2010) is that porphyry clusters reflect the intermittent activities of underlying magma chambers and their replenishments.

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