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ABSTRACT

The Udokan Cu–Ag deposit in Transbaikalian Russia is one of the largest individual examples of the sediment-hosted stratiform type. Mineralization is hosted by the Udokan Complex, a ~12,000-m-thick metasedimentary sequence deposited between ~2.2 and 2.06 Ga in a large intra- to peri-cratonic basin constructed over Archean basement of the Siberian craton. The basin was inverted and metamorphosed to dominantly greenschist facies at ~1.9 Ga, as a consequence of the collision between the Aldan and Stanovoi domains.

Titanite is a common constituent of the greenschist metamorphic assemblages of the Udokan Complex as well as being an integral part of the stratiform disseminated and associated veinlet Cu sulfide mineralization at Udokan. Titanite crystals were separated from a sample collected in the Medny area of the deposit where typical, high-grade, disseminated and veinlet chalcocite-bornite mineralization is well exposed. Titanite crystals from the disseminated and veinlet fractions were separately dated by the ID-TIMS U–Pb method, with the disseminated fraction returning a concordia age of 1895.3 ± 9.7 Ma and the veinlet fraction a concordia age of 1896.7 ± 7.8 Ma. Combination of both titanite fractions produced a concordia age of 1896.2 ± 6.2 Ma.