

Cobalt Mineralization Age for the Fishtie Cu-Co deposit in Zambia

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The Central African Copperbelt (CACB) is the most important cobalt producing area in the world with ~50% of global reserves being held in deposits in Zambia and the Democratic Republic of Congo. These deposits are hosted in sedimentary rocks of the Neoproterozoic Katangan Supergroup. Deposition of the host rocks was initiated after 883 ± 3 Ma within an extensional intracratonic basin and terminated during the Lufilian Orogeny (~530 – 600 Ma), however the age and mechanism of copper and cobalt mineralization in the CACB is still being untangled. To help put bounds on the timing of the mineralization, we have investigated the Fishtie Cu-Co deposit, which is currently the easternmost Cu-Co deposit of the CACB. Using Re-Os geochronology, we have produced model ages of cobaltite vein mineralization at 492 ± 3 Ma. This age is among the youngest well constrained ages within the entire CACB suggesting that late fluid events were still occurring after the waning stages of the Lufilian Orogeny. To confirm the reliability of these results LA-ICP-MS mapping of trace elements (e.g., Re, Mo) was conducted and it demonstrated that cobaltite within this sample is a relatively homogenous host of trace elements with no evidence of later remobilization. These investigations also noted a more complicated trace element profile and oxidation of minor copper mineralization within these samples. Dating of these samples result in anomalous and inconsistent ages, which emphasizes the need of careful sample preparation and documentation.