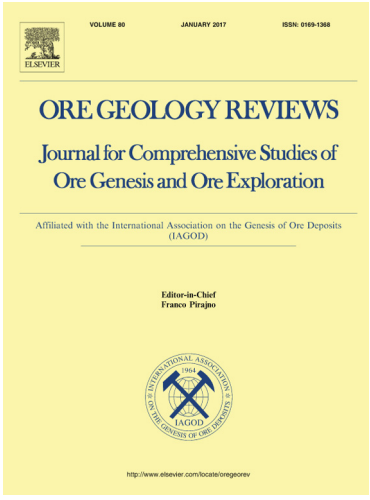

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PII: S0169-1368(17)30321-9
DOI: http://dx.doi.org/10.1016/j.oregeorev.2017.07.025
Reference: OREGEO 2295

To appear in: *Ore Geology Reviews*

Received Date: 21 April 2017
Revised Date: 25 July 2017
Accepted Date: 30 July 2017

Please cite this article as: L. Shen, C. Liu, J-x. Zhao, Y. Feng, L. Wang, J. Zhou, The remaking of the Mengyejing potash deposit in Yunnan, China: Evidence from Rb-Sr isotopic systematics, *Ore Geology Reviews* (2017), doi: http://dx.doi.org/10.1016/j.oregeorev.2017.07.025

The remaking of the Mengyejing potash deposit in Yunnan, China: Evidence from Rb-Sr isotopic systematics

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Abstract: The Mengyejing potash deposit (MPD) is the first significant ancient potash deposit ever found in China, and it was considered to have formed during the middle to late Cretaceous. The $^{87}Sr/^{86}Sr$ ratios of potash bulk samples suggest that both bedded and veined potash orebodies of the MPD have been affected by igneous activity resulting from decompression melting of a metasomatically altered, depleted mantle from 16 Ma to present. The Rb-Sr isotopic systematics of the potash bulk samples define several apparent "isochrons" ranging from 0.609±0.026 to 14.23±0.63 Ma, with the maximum age being consistent with previous K-Ar ages of the K-bearing minerals from the MPD. Such isotopic signatures imply that the MPD may have been affected by multiple-stage fluid flow events since the mid-Miocene, consisting of hydrothermal fluids, continental fresh water, and/or hot spring water. It is very likely that the MPD is still affected by fluid flow-events in modern times. The mineral assemblage of halite + sylvite with minor amounts of carnallite was formed due to the recrystallization and diagenetic modification by hydrothermal fluids. Some characteristics of halite photomicrographs and inclusions and the lack of original halite chevron patterns are also supportive of the hypothesis that the deposit has undergone a diagenetic modification and dissolution-recrystallization processes.

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