

The genesis of Mengyejing potash deposit in Lanping-Simao basin, Yunnan Province, China

XIANG GAO AND QINGFANG FANG

Institute of Earth Sciences, China University of Geosciences, Beijing, China. (*correspondence: xiang.gao@sohu.com)

Mengyejing Potash Deposit in Lanping-Simao Basin of Yunnan (MPDY) Province is an unique and ancient chloride type solid potash deposit in China. The salt layer in Mengyejing Formation (MF) and its underlying Bashahe Formation (BF) were studied by XRD, ICP-MS, EPMA, microscopy and cooling-heating methods of halite fluid inclusions in order to find out the source and origin of the deposit. The results show that from the white halite layer → grayish sylvite layer → grayish sylvite layer bearing carnallite, the homogenization temperatures are increase gradually, that is from 23.8°C → 27.7°C → 38.6°C . This trend is consistent with the crystallization sequence of salt minerals, i.e., halite → sylvite → carnallite. The average value of trace element Bromine (Br) in evaporates of MF is 578×10^{-6} which is higher than 200×10^{-6} , indicating Br came from sea water, and a small amount of marine mineral glauconite exists in quartz sandstone of lower BF. At the same time, lots of pyrite riching Co and Ni exist in grayish green mudstone of MF. Furthermore, comblainite bearing Co and Ni is one of the main mineral phases of fracture filling in the salt layer, and azurite and malachite that contain copper minerals are found in quartz sandstone of BF. The elements of Cu, Co and Ni in minerals were provided by deep hydrothermal because the deposit was located in strong active tectonic belts. Therefore, sea water and deep hydrothermal all provided important potassium sources for the formation of MPDY.