塔里木盆地西南部和北部盐泉水化学特征及找钾指标探讨

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中文摘要:对塔里木盆地西南部及北部盐泉水化学特征、成因进行了研究，同时对研究区水化学离子比值作了探讨并提出相应的找钾指标体系。野外采样分析和收集文献资料共获得件盐泉水样数据。塔里木盆地西南部(莎车盆地)水化学类型主要为硫酸盐型(硫酸镁亚型和硫酸钠亚型)，少数为氯化物型，而北部(库车盆地)氯化物型占主导，其次是硫酸盐型。盐泉水化过程较复杂，包含了深部物源补给、盐岩溶滤、地表水的混合以及强烈蒸发作用的影响。从水化学特征系数(离子比值)看，研究区钾氯系数、镁氯系数、钠氯系数，结合硼氯系数，综合作为找钾指标; 盐泉水贫溴的特点导致大部分数据点溴氯系数极低、钾溴系数又极高，建议不作为最主要的水化学找钾指标。利用SPSS软件对盐泉水各化学组分、矿化度和离子比的环境背景值作了统计计算。水化学特征系数背景值和异常值指标体系的确定为今后在开展水化学方法找钾和预测成钾靶区提供了有利的数据支持和依据。

中文关键词:盐泉水 找钾 离子比值 环境背景值 塔里木盆地

Saline Spring Hydrochemical Characteristics and Indicators for Potassium Exploration in Southwestern and Northern Tarim Basin, Xinjiang

Abstract:In this paper, hydrochemical characteristics and origin of saline springs/brines in southwestern and northern Tarim Basin were studied, ionic ratios were discusse and a corresponding indicator system was suggested for potassium exploration. Analytical data of 194 saline spring/brine samples were obtained from both field survey and geochemical materials available. It is found that saline springs/brines in southwestern Tarim Basin (Shache Basin, a sub-basin) mainly belong to the sulfate type, with a few belonging to the chloride type, while in northern Tarim Basin (Kuqa Basin, a sub-basin), the chloride type is dominant, followed by the sulfate type. Evolution processes of sa springs/brines in this area are very complicated, consisting of recharge from the depth of the earth, water-rock salt interaction, inflow of surface water and strong evaporation for potassium exploration, the potassium-to-chloride ratio, the magnesium-to-chloride ratio, the sodium-to-chloride ratio and the boron-to-chloride ratio can well serve as indicators for potassium deposit prediction instead of the bromine-to-chloride ratio and the potassium-to-bromine ratio, due to the paucity of bromine in the basin. The determination of environmental background values for chemical components, TDS and ionic ratios can provide useful information and references for potassium exploration the Tarim Basin as well as in other saline basins of China.