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Integrating Geochemical and Geophysical Method in Coexistence of Oil and Potassium to Identify K-rich Brine: Research and Application in Southwestern Sichuan

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Lithology of Triassic in southwestern Sichuan is consistent with the whole basin, and there is no discussion about stratum division, the difference is stratum denudation which is made by the uplifting of Luzhou uplift, especially the Leikoupo formation. Brine formation with rich potassium is mainly saved in stratum of Triassic, the Triassic is divided as four water formation and the situation in potassium is different. The paper integrates the analysis data of water and geophysics methods to identify brine formation with rich potassium.

Firstly, this paper makes a comprehensive analyses on the data of the analysis of water samples of the study area, using the salinity of formation water features of different formations to select three favorable potassium district, and then utilizing the rich conditions of potassium to subdivide it. The geochemical characteristics of the salinity of formation water features, Br-Cl coefficient and Mg-Cl coefficient are used to select a series of favorable structure including Hebao, Huangjia and Jieshi, and it shows the brilliant prospects of identifying the potassium in brine formation in southwestern Sichuan.

Finally, the K-rich brine is analysed in qualitative and quantitative. Brine formation have been identified by Geophysical Method which includes Crossplot method, Porosity overlapping method and Water saturation method, and then the potassium content in brine formation has been calculated to identify the brine formation with rich potassium. This paper has accomplished the identifying of the brine formation with rich potassium and the forecasting of the rich potassium area in the exploring oil and potassium at the same time in the southwestern Sichuan.

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