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Logging Response Characteristics for Pore Brine Potassium Reservoir in the West of Qaidam Basin

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Pore brine potassium and deep sand gravel layer found is of large size and high economic value liquid potash deposit in western Qaidam basin depression tectonic (Fig. 1). Because the reservoir is relatively thick, it is difficult to obtain all rock cores through the drilling, and the exploration time is very long, the cost is expensive; besides the traditional logging cannot accurately measure the gravel layer and reservoir characteristic. Thus, it is great significance for future exploration to research the sandy gravel layer reservoir's logging response. It could identify rock character and shorten the exploration period. In this paper, compared with drilling core and logging curve, using the logging principle to analysis the radioactive logging (natural gamma logging and compensation density logging) and electrical logging (spontaneous potential logging, dual induction - eight direction logging, and compensation acoustic logging). We learn that in western Qaidam basin pore brine potassium ore has special logging response characteristics on sedimentary rhythm, parent rock feature and potassium of brine. In the logging curves, because of the single thinner and developer clay layer layers contains rich potassium, the natural gamma become larger, compensated sonic become larger, compensated density become smaller, compensated

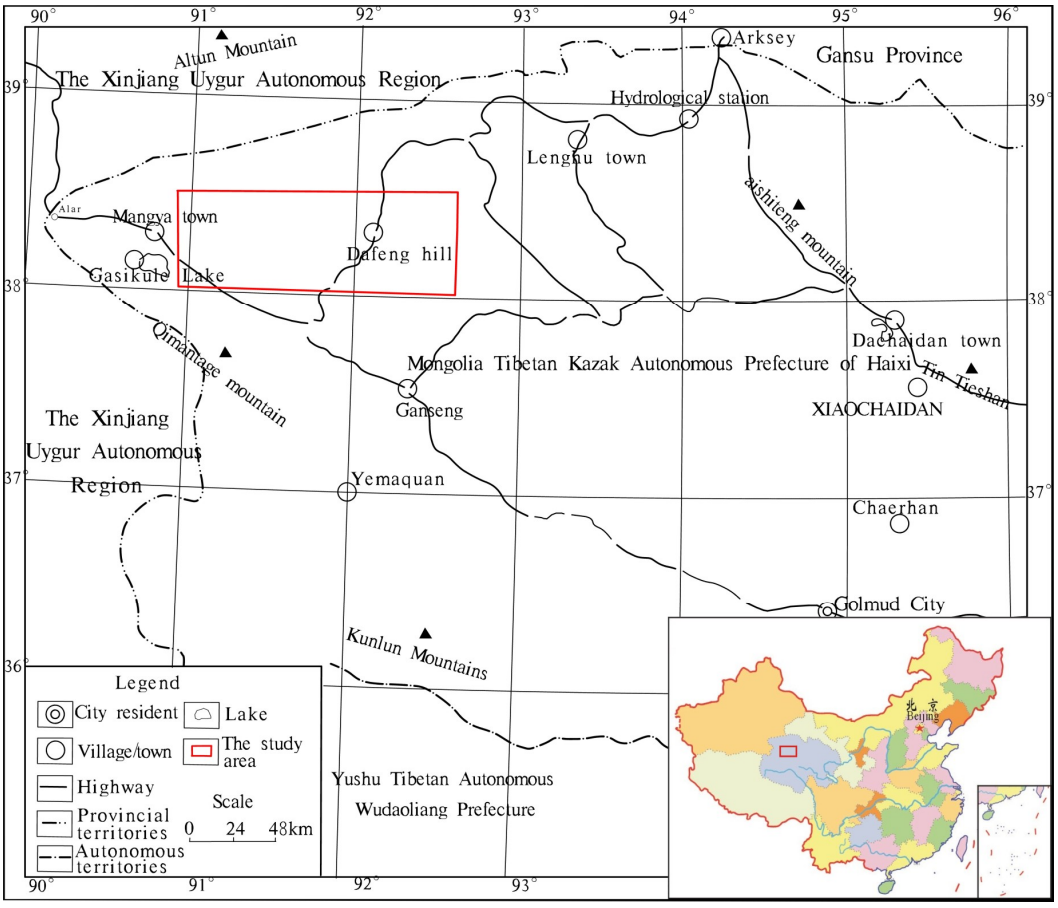

Fig. 1. Study area geological map.

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neutron become smaller, deep induction, middle induction and eight direction's curve seem similar, but the deep one is slightly lower than middle induction, and middle induction lower than eight direction. Compared with single thicker layer, the clay layers lack of potassium rich brine, but they have high mudstone, which can absorb more potassium radiation, so natural gamma logging curve become larger, compensated sonic values become smaller, compensation density value become larger, compensated neutron become lower, but deep induction, middle induction and eight direction's curve are difference. Deep induction are significantly higher than middle induction, middle induction are also higher eight direction's values. Between siltstone layer, silver sand layer, sand gravel layer are which are thinner and clayey which are grown bedding contain rich potassium, brine well logging curves have these feature: the natural gamma ray and compensated sonic values become bigger, compensated density and compensated neutron values are smaller, deep induction is slightly lower than middle induction, middle induction is slightly lower than eight directions. It is a new and difference cognition with the traditional log interpretation, and has great significance to precisely distinguish stratum and study the sedimentary formation.

Key words: log response, western Qaidam basin, depression tectonics, brine pore reservoir, liquid potash

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