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C<sub>5</sub>–C<sub>13</sub> light hydrocarbons of crude oils from northern Halahatang oilfield (Tarim Basin, NW China) characterized by comprehensive two-dimensional gas chromatography

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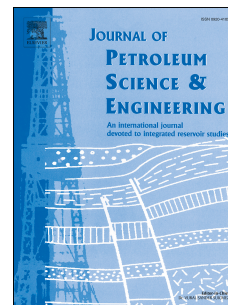
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**C<sub>5</sub>–C<sub>13</sub> light hydrocarbons of crude oils from northern Halahatang oilfield (Tarim Basin, NW China)  
characterized by comprehensive two-dimensional gas chromatography**

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**Abstract:** The Halahatang Oilfield in the Tabei Uplift of the Tarim Basin has substantial petroleum potential and contains many prolific commercial oil reservoirs. In this study, a total of 15 DST oils were sampled from the northern Halahatang oilfield, and their geochemistry of C<sub>5</sub>–C<sub>13</sub> light hydrocarbons (LHs) is characterized by two-dimensional gas chromatography (GC×GC). The concentrated clusters in the LH triangular diagrams and parent-daughter plots of the *n*-Heptane (%C<sub>7</sub>) vs. In (Cps/CHs) corroborating with the similar K<sub>1</sub> values (1.01–1.23), imply a high degree of compositional similarity and source affinity. The C<sub>7</sub> LHs show a predominance of *n*-heptane (30.07%–42.75%) and a nearly identical abundance of MCyC<sub>6</sub> (35.92%–45.85%), low I<sub>MCyC<sub>6</sub></sub> (methylcyclohexane index) value (35.92%–45.57%) and a moderate I<sub>CH</sub> (cyclohexane index) value (25.92%–45.66%), demonstrating that they were typical marine oils mainly originated from a substantial amount of sapropelic organic matter mixed with a nearly equivalent amount of humic one. The LH maturity indexes, such as the heptane (H) ratio (17.80%–29.28%), isoheptane (I) ratio (1.25–2.15), °C<sub>temp</sub> (113.72 °C –124.63 °C), methyladmantane index (MAI: 52.15%–63.65%) and equivalent vitrinite reflectance (1.1%–1.3% R<sub>o</sub>) indicate a high thermal maturity. The values of 3-ethyl-2-methylheptane to 3-methylnonane (MT<sub>1</sub>: 0.91–3.65), 1,1,2,3-tetramethylcyclohexane to

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