PETROLEUM AND GAS PROCESSING

CRUDE FROM THE OSTASHKOVICHSKII DEPOSIT
OF THE BELORUSSIAN SSR


The Ostashkovichskii petroleum deposit is the largest in the territory of the Belorussian SSR. The crude is confined to the intersalt and subsalt deposits of the Upper Devonian.

Table 1 gives the physical and chemical properties of Ostashkovichskii crudes. It is evident from Table 1 that crudes taken from subsalt deposits (wells 3, 7) are characterized by a low sulfur content (less than 0.5%) and, in accordance with GOST (All-Union State Standard) 912-66, are classified as low-sulfur. The sulfur content in crudes from intersalt deposits (wells 2, 30) is considerably higher, and is 0.603 and 1.080%, respectively. With respect to their content of tarry substances and paraffin, the Ostashkovichskii crudes are in the medium range, with the exception of the crude from well 30, which is high in tars (content of silica-gel tars 28.8%) and high in paraffin (paraffin content 7.6%).

With respect to their fractional composition, crudes from subsalt deposits contain more fractions boiling up to 200 and 350°C, in comparison with crudes from intersalt deposits.

From Table 2, which characterizes the gasoline fractions 28-85, 18-120, 28-150, and 28-200°C, it is evident that the octane numbers of the latter fractions (GOST 511-61, motor method) decrease as their composition becomes heavier. The antiknocking capacity of gasoline fractions from subsalt crudes is considerably better when compared to analogous fractions from intersalt crudes. The octane numbers of the 28-200°C fractions with 0.82 g of tetraethyl lead per kg fuel are also low, i.e., from 56.6 to 65.4; their sulfur content is insignificant, i.e., up to 0.04%. Consequently, automobile gasolines based on the light fractions of Ostashkovichskii crudes require the use of high-octane additives.

Judging by their content of naphthenic hydrocarbons (25-35%) and of sulfur (0.017%), the fractions boiling within the limits of 62-120°C constitute a satisfactory feedstock for catalytic reforming (Table 3).

TABLE 1. Physical and Chemical Characteristics of Crudes from the Ostashkovichskii Deposit

<table>
<thead>
<tr>
<th>Well</th>
<th>Drilling depth</th>
<th>Density, g l⁻¹</th>
<th>Viscosity, cP</th>
<th>Pour point, °C</th>
<th>Cold filterability, °C</th>
<th>Acid number, mg KOH</th>
<th>Content, wt. %</th>
<th>Melting temperature of paraffin, °C</th>
<th>Content of gas, wt. %</th>
<th>Yield of light fraction, wt. %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2618–2658,5</td>
<td>0.8433</td>
<td>23.7</td>
<td>+13</td>
<td>2.0</td>
<td>0.017</td>
<td>0.603</td>
<td>1.090</td>
<td>0.017</td>
<td>1.24</td>
</tr>
<tr>
<td>30</td>
<td>2690–2732</td>
<td>0.8818</td>
<td>74.0</td>
<td>+5</td>
<td>4.23</td>
<td>0.033</td>
<td>1.100</td>
<td>0.195</td>
<td>0.025</td>
<td>0.92</td>
</tr>
<tr>
<td>3</td>
<td>3200–3243</td>
<td>0.8401</td>
<td>36.7</td>
<td>+13</td>
<td>2.97</td>
<td>0.022</td>
<td>0.496</td>
<td>0.17</td>
<td>0.002</td>
<td>0.78</td>
</tr>
<tr>
<td>7</td>
<td>3265–3253</td>
<td>0.8301</td>
<td>21.8</td>
<td>+16</td>
<td>1.30</td>
<td>0.016</td>
<td>0.480</td>
<td>0.13</td>
<td>0.002</td>
<td>0.72</td>
</tr>
</tbody>
</table>

meeting the specifications of GOST 10585-63, while residues, after separation of fractions up to 450°C, can be used for high-quality grades of lubricating oils. The data given in Table 6 indicate that the 150-280°C fractions have high cetane numbers (60-62), a relatively low pour point (from minus 16 to minus 34°C), and only a very small sulfur content (less than 0.35%). Consequently, they can be used for the preparation of Grade "L" diesel fuel, in accordance with GOST 305-62.

It is evident from Table 5 that the 150-280°C fractions of all the crude studied have good photometric properties (height of sootless flame 26-28 mm) and contain only a small amount of sulfur (less than 0.25%); as a result, light kerosenes can be obtained from them.

The 120-240°C fractions of intersalt crudes (wells 2, 30) satisfy the specifications of GOST 10227-62 for Grade T8-1 jet fuel (Table 4), while, at the same time, fractions from subsalt deposits (wells, 3, 7) do not satisfy the standard specifications with respect to the temperature of the start of crystallization.

It is evident from Table 5 that the 150-280°C fractions of all the crude studied have good photometric properties (height of sootless flame 26-28 mm) and contain only a small amount of sulfur (less than 0.25%); as a result, light kerosenes can be obtained from them.