INFORMATION

PRESENT STATE OF AND MAIN TRENDS IN THE
DEVELOPMENT OF THE PETROCHEMICAL INDUSTRY
IN DEVELOPING COUNTRIES

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Petrochemistry, benefitting from great scientific discoveries in the postwar period, is developing at an ever-
increasing pace, and is becoming one of the most promising branches of industry in all countries.

Oil and natural gas have been the main and the most efficient source of raw material for a broad range of or-
ganic synthesis. Already, today, approximately 9% of the oil and 7% of the natural gas out of the world's produc-
tion* are used for the production of petrochemical products. In the year 2000, according to the predictions of many
specialists, up to 15-20% of all the oil and gas will be converted into petrochemical products. In 1968, the world
output of all petrochemical products was 96 million tons; by 1980 it will increase to 300-320 million tons, and in 2000,
it will reach 1000 million tons. Some foreign specialists think that within the next ten years approximately 95% of
all chemical products will be obtained from oil and natural gas.

Along with the rapid worldwide growth of the petrochemical industry, the output of petrochemical products
in the developing countries is still very low, while the present rates and the most advantageous directions of develop-
ment in these countries have not been clearly determined up to the present time. The level of the petroleum, oil
refining, and petrochemical industry in the developing countries, compared with all the countries of the world, can
be evaluated from the data of Table I [1].

These data permit drawing the following conclusions:

1. The developing countries of Africa, the Near and Middle East, Latin America, and Asia dispose of huge
sources of petrochemical raw material in the form of oil and gas. In 1968, the explored oil reserves here were al-
most 9/10 of the world's resources, while the extraction was almost 2/3 of the world's extraction. In particular, the
countries of Africa and the Near and Middle East have great reserves of oil; here are concentrated about 4/5 of the
world's reserves, and is extracted more than 45% of the world extraction of oil.

2. In comparison with the volumes extracted and the reserves of oil, only insignificant oil refining capacities
are concentrated in the developing countries. In 1968 the total capacity of the oil refineries in this area was only
1/4 of the world capacity, which permitted refining less than 40% of the oil extracted in these countries; more than
60% of the oil extracted was exported and was refined in the oil refineries of the developed capitalistic countries.

3. The petrochemical industry in the developing countries stands at a very low level. Here there are pro-
duced in all 960 thousand tons of petrochemical products, or 1% of the world output. In the countries of Africa, this
branch of industry is practically absent, while in the countries of Asia (without Japan), it is in the very earliest stage
of development.

In spite of the considerable reserves of oil and natural gas which are at the disposition of the developing coun-
tries as a whole, their geographical distribution is extremely uneven, as a result of which the problem of hydrocar-
bon raw materials for petrochemistry in a number of countries remains quite acute. For example, in the countries
of Latin America, out of 4070 million tons of explored oil reserves, 3430 million tons, or about 85%, belong to

* Here and in what follows, the terms world extraction, production, and demand do not include data on the socialist
countries.

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**TABLE 1**

<table>
<thead>
<tr>
<th>Indices</th>
<th>Capitalistic and developing countries</th>
<th>Africa</th>
<th>Near and Middle East</th>
<th>Latin America (including Mexico)</th>
<th>Asia (without Japan)</th>
<th>total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explored oil reserves: *</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>millions of tons</td>
<td>54794</td>
<td>5908</td>
<td>37010</td>
<td>4070</td>
<td>1503</td>
<td>48491</td>
</tr>
<tr>
<td>%</td>
<td>100,0</td>
<td>10,8</td>
<td>67,5</td>
<td>7,4</td>
<td>2,7</td>
<td>88,4</td>
</tr>
<tr>
<td>Extraction of oil: †</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>millions of tons/year</td>
<td>1660</td>
<td>194</td>
<td>559</td>
<td>260</td>
<td>43</td>
<td>1057</td>
</tr>
<tr>
<td>%</td>
<td>100,0</td>
<td>11,7</td>
<td>33,7</td>
<td>15,7</td>
<td>2,6</td>
<td>63,7</td>
</tr>
<tr>
<td>Capacity of oil refineries:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>millions of tons/year</td>
<td>1928</td>
<td>38</td>
<td>115</td>
<td>245</td>
<td>82</td>
<td>480</td>
</tr>
<tr>
<td>%</td>
<td>100,0</td>
<td>2,9</td>
<td>6,0</td>
<td>12,7</td>
<td>4,3</td>
<td>25,0</td>
</tr>
<tr>
<td>Oil refining: ‡</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>millions of tons/year</td>
<td>1660</td>
<td>33</td>
<td>99</td>
<td>211</td>
<td>71</td>
<td>414</td>
</tr>
<tr>
<td>%</td>
<td>100,0</td>
<td>16,8</td>
<td>17,7</td>
<td>81,3</td>
<td>164</td>
<td>39,2</td>
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<tr>
<td>Production of petrochemical products:**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>thousand of tons/year</td>
<td>96000</td>
<td>0,0</td>
<td>150</td>
<td>810</td>
<td>No information</td>
<td>960</td>
</tr>
<tr>
<td>%</td>
<td>100,0</td>
<td>0,0</td>
<td>0,16</td>
<td>0,84</td>
<td>1,0</td>
<td></td>
</tr>
</tbody>
</table>

† In 1968.
‡ Calculated by the authors of the article, starting from a load of the productive capacities of the oil frequencies equal to 86%.
** in 1967.

**TABLE 2**

<table>
<thead>
<tr>
<th>Products</th>
<th>Demand for petrochemical products, thousands of tons</th>
<th>Rise in demand by 1980, % referred to 1975</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1975</td>
<td>1980</td>
</tr>
<tr>
<td>Plastics</td>
<td>210</td>
<td>488</td>
</tr>
<tr>
<td>Synthetic fibers</td>
<td>9</td>
<td>35</td>
</tr>
<tr>
<td>Synthetic rubbers</td>
<td>48</td>
<td>128</td>
</tr>
</tbody>
</table>

Venezuela, Mexico, and Argentina. Out of 5908 million tons of explored oil reserves in Africa, 5810 million tons, or more than 97%, belong to four countries, Libya, Algeria, Nigeria, and the UAR. An analogous situation exists also in the countries of Asia, where 80% of the explored oil reserves are concentrated in a single country, Indonesia. Only in eight developing countries is there industrial extraction of natural gas: in three of them, Mexico, Venezuela, and Argentina, there was extracted in 1968 about 70% of the total amount of gas extracted from the resources in the developing countries.

The Second Interregional Symposium of UNIDO,* held in Baku on October 21–31, 1969, was devoted to an examination of the question of ways of developing the petrochemical industry in the developing countries. Representatives of 41 countries, including 26 developing countries, 10 capitalistic, and five socialistic countries, participated in the work of the symposium. In all, 250 specialists participated in the work of the symposium; these included petrochemical and refining experts, economists, specialists in the field of planning, designers, etc. Among the participants, there were 104 foreign, and 146 Soviet specialists.

* UNIDO is an organization for the industrial development of the countries of the United Nations. The First Interregional Symposium was held in Teheran in December, 1964.

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