SPHERICAL REFORMING CATALYST SPR-81  
(TYPE A AND TYPE B)

**Description**

SPR-81A catalyst is designed for fixed bed reforming units with periodical catalyst regeneration.

SPR-81B catalyst is designed for moving bed reforming units and continuous catalyst regeneration.

Main physico-chemical properties of the catalyst are presented in the table.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Type of the catalyst</th>
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<tbody>
<tr>
<td></td>
<td>SPR-81A</td>
</tr>
<tr>
<td>1 Sphere diameter, mm</td>
<td>1,6±0,2</td>
</tr>
<tr>
<td>2 Mass fraction of the catalyst components counting on calcined at 850 °C material, %:</td>
<td></td>
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<tr>
<td>– platinum</td>
<td>0,25±0,02</td>
</tr>
<tr>
<td>– rhenium</td>
<td>0,30±0,02</td>
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<tr>
<td>– promoter</td>
<td>0,30±0,05</td>
</tr>
<tr>
<td>3 Mass fraction of impurities counting on calcined at 850 °C material, %:</td>
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<tr>
<td>- sodium oxide, no more than</td>
<td>0,02</td>
</tr>
<tr>
<td>- iron, no more than</td>
<td>0,02</td>
</tr>
<tr>
<td>4 Crushing strength, kg/cm², no less than</td>
<td>200</td>
</tr>
<tr>
<td>5 Packed density, kg/m³, no more than</td>
<td>700</td>
</tr>
<tr>
<td>6 Specific surface area, m²/g, no less than</td>
<td>200</td>
</tr>
</tbody>
</table>

Figure 1 demonstrates the appearance of obtained laboratory sample of SPR-81 catalyst. The sample has perfect spherical shape: grain diameter is 1.6±0,1 mm with eccentricity lower than 1 %.

![Fig. 1. Appearance of the catalyst SPR-81.](image)

**Technical appraisal and economic advantages**

Spherical catalyst SPR-81A has the following advantages in comparison with extruded reforming catalyst:

- high strength and low wearability practically completely exclude dust formation and catalyst loss during its production and operation;
- capability of sock loading providing maximal packing density of the catalyst bed;
- absence of shrinkage during operation;
- maximal efficiency of feed and catalyst bed interaction;
- low porosity of spherical catalyst bed (0.39-0.40 versus 0.42-0.43 for extrudates) decreases the possibility for increase of pressure differential in radial flow reactors.

SPR-81B catalyst is assigned for replacement of foreign analogues for reforming units with moving bed and continuous catalyst regeneration. At the same time SPR-81B catalyst has much lower cost.

**Application areas**
SPR-81A catalyst is designed for fixed bed reforming units with periodical catalyst regeneration. Potential market – 40 units in Russia and about 20 units in CIS countries (annual demand is 400-500 tons).

SPR-81B catalyst is designed for moving bed reforming units and continuous catalyst regeneration. Potential market – 7 units in Russia and 3 units in CIS countries (annual demand is 100 tons).

**Development stage**
Research has been carried out, laboratory scale technique for preparation of SPR-81 catalyst was elaborated and pilot tests of the catalysts with industrial feed have been carried out with confirmation of stated parameters.

**Patent situation**

**Commercial offers**
Joint development of pilot sample.

**Estimated cost**
SPR-81A catalyst – the cost is comparable to the cost of known extruded commercial analogues which are operated on fixed bed reforming units.

SPR-81B catalyst – the cost is 1.5-2 times lower than the cost of known foreign analogue purchased at present time in Russia for moving bed reforming units.

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