Choice of Hydrotrope

Essential ingredients for efficient water based products
Choice of hydrotrope for liquid cleaners

Hydrotropes are organic compounds that increase the solubility of a surfactant in a formulation. Traditional hydrotropes, such as sodium cumene sulfonate, bring no additional value to the cleaning process.

Multifunctional hydrotropes are cosurfactants that bring additional value to formulations in synergy with the primary surfactant. High performance at low concentration, foam control, tolerance to alkali and electrolytes, minimal impact on the environment and low human and aquatic toxicity are examples of such additional benefits.

<table>
<thead>
<tr>
<th>Product name</th>
<th>Foam height, mm* immediately</th>
<th>CLP, GHS**</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>AG 6202</td>
<td>8</td>
<td>-</td>
<td>Alkyl glucoside</td>
</tr>
<tr>
<td>AG 6206</td>
<td>0</td>
<td>-</td>
<td>Alkyl glucoside</td>
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<tr>
<td>Ampholak XCE</td>
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<td>-</td>
<td>Amphoteric</td>
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<tr>
<td>Ampholak YCE</td>
<td>125</td>
<td>-</td>
<td>Amphoteric</td>
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<tr>
<td>Ampholak YJH-40</td>
<td>15</td>
<td>Not classified</td>
<td>Amphoteric</td>
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<tr>
<td>Berol R648 NG</td>
<td>32</td>
<td>-</td>
<td>Cationic surfactant</td>
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<td>Berol R648 PO</td>
<td>32</td>
<td>-</td>
<td>Cationic surfactant</td>
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<tr>
<td>Berol SurfBoost AD15</td>
<td>30</td>
<td>Not classified</td>
<td>Alkyl amide ethoxylate</td>
</tr>
</tbody>
</table>

* according to Ross-Miles, 50°C, 0.05%  
** CLP (Classification, Labelling and Packaging of substances and mixtures)  
GHS (Globally Harmonized System of classification and labelling of chemicals)

Hydrotropic effect

The requisite amount of hydrotrope depends on the amount and cloud point of the nonionic, but also on the amount and type of builders.
Boosting degreasing at room temperature

Black box cleaning test on train soil, dilution 1:40

Black box cleaning test on train soil, dilution 1:80

Boosting cleaning performance using only
1,25% Nonionic
0,8% Complexing agent
Hydrotrope (cloud point >70°C)

Boosting cleaning performance using only
0,625% Nonionic
0,4% Complexing agent
Hydrotrope (cloud point >70°C)

Solubility of hydrotropes in NaOH solution

Alkyl glucosides and amphoteric hydrotropes can be successfully used in concentrated salt and alkali formulations.

Foaming in "Vindan"

Ampholak YJH-40 and AG 6202 give low foam when combined with a low foaming nonionic surfactant. If extremely low foam is required, Berol 840 can be used in the formulation instead of Berol 260.
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