Reusable Photosensitive Materials Showing Reversible Solid-Liquid Phase Transition

Can be repeatedly liquefied from solid form by UV light and solidified from liquid form by visible light at room temperature.

Application 1

Light Adhesion

Two glass slides containing this material adhere to each other by irradiation with 450 nm light. After phase transition, irradiation with 365 nm light reliquifies the material and breaks adhesion.

Light Non-adhesion

These materials show a maximal adhesion value of 60 N cm⁻² (0.6 MPa). B4598 (R=C₁₂H₂₅) exhibits the highest adhesion value.

Advantage

Reference


<table>
<thead>
<tr>
<th>Compound</th>
<th>500mg / 5g</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,4'-Bis(hexyloxy)-3-methylazobenzene</td>
<td>[B4596]</td>
</tr>
<tr>
<td>4,4'-Bis(decyloxy)-3-methylazobenzene</td>
<td>[B4597]</td>
</tr>
<tr>
<td>4,4'-Bis(dodecyloxy)-3-methylazobenzene</td>
<td>[B4598]</td>
</tr>
</tbody>
</table>

*These materials are under invention licenses by the Advanced Industrial Science and Technology (AIST), Japan.
If you intend to use these materials for industrial purposes, please contact us.
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Application 2

Photoresist for lithography

These materials can be easily blown and washed-off, making them applicable to simple lithography processes.

References
(provided by AIST)

Photoresponses of crystalline film in polarized light microscopy

B4596
365 nm
UV
8 sec
Vis
1 sec

B4597
UV
17 sec
Vis
1 sec

B4598
UV
55 sec
Vis
1 sec

*Each sample thickness is ca. 1 µm. Photoresponse time dependent on film thickness and light intensity.
(provided by AIST)

Ordering and Customer Service

TCI EUROPE N.V.
Tel : +32 (0)3 735 07 00
Fax : +32 (0)3 735 07 01
E-mail : Sales-EU@TCIchemicals.com

TCI Deutschland GmbH
Tel : +49 (0)6196 64053-00
Fax : +49 (0)6196 64053-01
E-mail : Sales-DE@TCIchemicals.com

Tokyo Chemical Industry UK Ltd.
Tel : +44 (0)1865 784560
Fax : +44 (0)1865 784561
E-mail : Sales-UK@TCIchemicals.com

TCI Chemicals (India) Pvt. Ltd.
Tel : 1800 425 7889 / 044-2262 0909
Fax : 044-2262 8902
E-mail : Sales-IN@TCIchemicals.com

TOKYO CHEMICAL INDUSTRY CO., LTD.
Tel : +81 (0)3-5640-8878
Fax : +81 (0)3-5640-8802
E-mail : globalbusiness@TCIchemicals.com

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