Bio-Based Chelating Agent: Biopure™ GLDA

FUNCTIONALITY MEETS ENVIRONMENTALLY SAFE

Biopure™ GLDA is an ideal chelating agent that is powerful, readily biodegradable, and is highly stable over a wide pH range. This effective chelating agent exhibits high performing metal binding properties, high solubility properties and functions as a perfect low eco-tox alternative to market standard chelating agents such as EDTA, NTA, Phosphates and Phosphonates. Biopure™ GLDA is bio-based, does not require hazardous labeling, is NTA free, and is highly pure. Additional benefits include preservative boosting and natural anti-discoloration properties.

<table>
<thead>
<tr>
<th>Chelate</th>
<th>Strong Chelate</th>
<th>Readily Biodegradable</th>
<th>Safe for Man and Environment</th>
<th>Bio-Based</th>
</tr>
</thead>
<tbody>
<tr>
<td>GLDA</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>EDTA</td>
<td>✓</td>
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<td>×</td>
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<tr>
<td>NTA</td>
<td>✓</td>
<td>✓</td>
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<td>×</td>
</tr>
<tr>
<td>Phosphates</td>
<td>✓</td>
<td>Inorganic</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>Phosphonates</td>
<td>✓</td>
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</tr>
</tbody>
</table>

IDEAL FOR

- Hard surface cleaners
- Laundry detergents
- Industrial cleaners
- Dishwashing detergents
- Personal care products
- Wet wipes
- Textiles
- Fertilizers
Jarchem’s bio-based Biopure™ GLDA is the strongest readily biodegradable chelating agent.

- Ready Biodegradability Closed Bottle Test (OECD 301D) was used to show biodegradability over a course of 28 days.
- GLDA was tested to show immediate and increasing decomposition over time.

- When compared to EDTA & NTA, Biopure™ GLDA had the highest performance during solubility testing across a wide range of pH values (4 - 12).

- GLDA works as well as EDTA, if not better, as seen in testing for Calcium Sequestration Values at a pH of 11 and temperature of 27°C.

- Biopure™ GLDA, like EDTA, binds to calcium ions in the cell membranes of bacteria, naturally weakening cell membranes to allow for greater efficacy of preservatives.

- Exhibit better boosting effect at pH 5.0 for *E.coli* and *Ps. Aeruginosa*. At pH of 7, boosting effect works well against *Staph. Aureus*.

- In testing done to evaluate various germ counts in sterile tap water over the course of 24 hours using a select preservative, Tetrasodium EDTA, and GLDA, it was shown that GLDA had the best effect at preventing bacteria growth.

- Testing used an unpreserved control, 0.75% of test preservative only, 0.75% of test preservative + 0.2% of Na₄EDTA, and 0.75% of preservative mixed with GLDA.