

Integrated process for preparing trioxane from formaldehyde**Abstract**

- 5 An integrated process for preparing trioxane from formaldehyde, comprising the steps of:
- 10 a) feeding a feed stream A1 comprising formaldehyde and water and a recycle stream B3 comprising predominantly water and additionally formaldehyde and trioxane to a formaldehyde concentration unit and separating it into a formaldehyde-rich stream A2 and a stream A3 consisting essentially of water;
 - 15 b) feeding a product stream C1 comprising trioxane, water and formaldehyde, a recycle stream E1 comprising trioxane, water and formaldehyde, and, if appropriate, the stream A2 to a first low-pressure distillation column and distilling at a pressure of from 0.1 to 1.5 bar, and withdrawing a trioxane-enriched stream B1 comprising predominantly trioxane and additionally water and formaldehyde, a bottom draw stream B2 consisting essentially of formaldehyde and water, and the recycle stream B3 comprising predominantly water and additionally formaldehyde and trioxane as a side draw stream;
 - 20 c) feeding the bottom draw stream B2 and, if appropriate, the stream A2 to a trioxane synthesis reactor and allowing them to react to obtain the stream C1 comprising trioxane, water and formaldehyde;
 - 25 d) feeding the stream B1 to a medium-pressure distillation column and distilling at a pressure of from 1.0 to 3.0 bar to obtain a low boiler stream D1 comprising methanol, methylal and methyl formate, and a stream D2 comprising predominantly trioxane and additionally formaldehyde and water;
 - 30 e) feeding the stream D2 to a high-pressure distillation column and distilling at a pressure of from 2.5 to 10.0 bar to obtain the recycle stream E1 comprising trioxane, water and formaldehyde, and a product stream E2 consisting essentially of trioxane;
- 35 the stream A2 being fed either to the low-pressure distillation column or to the trioxane synthesis reactor or to both.