

# Novel Clickable Alkyne-Terminated Sulfonamide Cyclodextrins with Extended Hydrophobic Cavity



## BACKGROUND

Cyclodextrins (CDs) are a family of cyclic oligosaccharides consisting of ring-shaped glucose subunits joined by  $\alpha$ -1,4 glycosidic bonds. CDs are produced from starch using an enzymatic conversion process with cyclodextrin glycosyltransferase. They have a hydrophilic exterior and an internal hydrophobic cavity, enabling them to encapsulate other molecules. This unique structure allows CDs to be used in a variety of applications, including pharmaceuticals, food additives, and cosmetics. However, existing CDs have limitations in binding and encapsulating small hydrophobic substrates effectively.

## DESCRIPTION

The disclosed technology involves a novel class of water-soluble, single-isomer, alkyne-modified sulfonamide cyclodextrins (CDs), specifically m-polyethylene glycol (PEG)-triazole-sulfonamide- $\beta$ -CD, created using the clickable chemistry derivatization technique, copper-catalyzed azide-alkyne cycloaddition (CuAAC). This new CD derivative has an extended hydrophobic cavity, significantly enhancing its ability to bind and encapsulate small hydrophobic substrates.

## ADVANTAGES

- **Enhanced Binding:** Improved hydrophobic cavity for stronger binding with small hydrophobic substrates.
- **Water Solubility:** The novel CD derivative is water-soluble, expanding its range of applications.
- **Versatility:** The CuAAC technique can be applied to other types of CDs ( $\alpha$ ,  $\gamma$ ), increasing the potential for broader utilization.

## APPLICATIONS

- **Pharmaceuticals:** Drug delivery system for water-insoluble drugs
- **Food and Beverages:** Encapsulation of flavors and additives
- **Cosmetics:** Enhanced encapsulation of active ingredients
- **Textiles:** Odor trapping and sustained release of fragrances

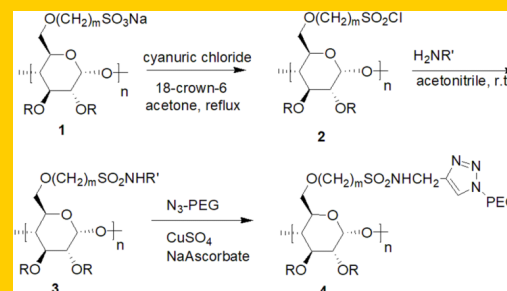
## INTELLECTUAL PROPERTY

- US Patent Application No. 63/635,202

## OPPORTUNITY

- Available to license

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General reaction scheme.



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