

# CARBOHYDRATE-DERIVED POLYTRIAZOLES.

## DESIGN, SYNTHESIS, PROPERTIES AND APPLICATIONS

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Carbohydrates, the main components of renewable biomass, are chemically versatile compounds. They may be readily modified with varied functionalities through routine synthetic protocols. Particularly, their conversion into azide and alkyne derivatives provides suitable monomers for the 1,3-dipolar cycloaddition reaction between azide and alkyne. The intra and intermolecular interactions as well as the thermal stability of the resulting polymers may be modulated by the use of different protecting groups. A family of stereoregular polytriazoles derived from D-glucose and D-galactose was obtained following several principles of Green Chemistry, namely bio-based starting materials, high yields, benign reaction conditions, energy efficiency, catalysis, atom economy, and chemical degradation. The chemical and thermal properties of these polymers were in agreement with their chemical structures, in particular according to the formation of hydrogen bonds. Some applications were also studied, i.e. as a stationary phase for cation removal in aqueous solutions, and the synthesis of nanoparticles to encapsulate active pharmaceutical ingredients, in order to reduce some side effects and improve the bioavailability.

