METHOD OF SYNTHESIS OF PERALKYLATED MONOSACCHARIDES WITH EMULSIFYING ACTIVITY

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Abstract

The emulsifying properties of peralkylated carbohydrates are described, as well as their manufacturing methods. the peralkylated carbohydrates have the capacity to dissolve organic compounds in water, such as benzene and hexane, in a wide range, making them useful for the transport of drugs, emulsion stabilizers and fat removers.

Description

The emulsifying properties of peralkylated carbohydrates are described, as well as their manufacturing methods, derivatizing them and obtaining compounds with lower polarity but still water soluble, which allows the hydrophobic phases to stabilize in polar media; this means that the peralkylated carbohydrates have the capacity to dissolve organic compounds in water, such as benzene and hexane, in a wide range, making them useful for the transport of drugs, emulsion stabilizers and fat removers.

Stage of research

Until now, the production of peralkylated monosaccharides has been carried out. To do this, permethylated and peretilated derivatives of glucose, galactose and mannose were synthesized, evaluating some peralkylation methodologies to prepare said derivatives and their characterization.

Applications field

Among the industrial applications of carbohydrates, we can find the excipients, an integral part of any drug delivery system and, although there are already a variety of excipients for very different applications in the market, cost is a factor of important deterrence.

By having hydrophilic and hydrophobic fractions, peralkylated carbohydrates can be used in the food industry as emulsion stabilizers, being an example of these, milk, ice cream or mayonnaise. Other interesting applications for peralkylated carbohydrates are found in the detergent industry. The amphiphilic properties of peralkylated carbohydrates give detergents the ability to remove fats using aqueous solutions of these compounds, presenting a crucial advantage over products currently on the market, which is the absence of foam.

Advantages

The peralkylated carbohydrate manufacturing method of the present development comprises two stages, initially attacking the anomeric position and proceed with the permethylation, which favors and facilitates the preparation of the peralkylated monosaccharides, particularly hexoses. By being derivatized with various alkyl chains, compounds of lower polarity are obtained, but they are still soluble in water, which allows them to stabilize hydrophobic phases in polar environments, which gives them advantages for drug transport, emulsion stabilizers and even as removers of fats.

Peralkylated carbohydrates have excellent properties such as surfactants, emulsifiers, non-ionic surfactants, and phase transfer agents. Its impact could not only be linked to processes in the manufacturing industry, but also in food and cosmetics, since carbohydrates as raw material are cheap, accessible on a ton scale, and provide a better elaborated and more variable chemistry than that of its polymers. In addition, it is sought that these molecules are easily degradable since they will be in continuous exposure to the environment.