

Synthesis of Surfactants from Renewable Raw Materials

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Abstract

Surfactants are used in different industrial sectors, currently non-renewable petrochemical resources are used for their production. The replacement of surfactants from petrochemical origin with surfactants deriving from renewable sources can reduce their environmental impact, thanks to their better biodegradability and lower eco-toxicity.

At this regard, a particularly interesting class of surfactants is represented by alkyl polyglucosides (APGs), which are obtained from vegetable origin's materials, they show an excellent eco-toxicological profile and high biodegradability in aerobic and anaerobic conditions [1]. Alkyl glycosides are synthesized with the Fischer glycosylation process which involves the acetalization of sugars catalyzed by an acid catalyst, in the presence of fatty alcohols.

In this paper inulin derived from cardoon roots has been used as source of sugars.

Inulin is a β -D-fructose polysaccharide, its monomers are joined with β -2,1-glycosidic bonds and it is completely transformed into D-fructose thanks to the action of acids or the enzyme inulinase. Among the different methods proposed in the literature [2-4], in this work, the mechanochemical depolymerization has been addressed [4].

The obtained products were used to synthesize different APGs through the reaction with different alcohols. The APGs obtained were subsequently characterized and finally tested to determine their emulsifying and foaming properties.

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