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Selective oxidation of diglycerol towards bio-based surfactants

AUTHORS
Nicolas DUGUET / UNIV LYON, 1 RUE VICTOR GRIGNARD, VILLEURBANNE
Huan WANG / UNIVERSITY OF LYON, 1 RUE VICTOR GRIGNARD, VILLEURBANNE
Estelle METAY / UNIVERSITY OF LYON, 1 RUE VICTOR GRIGNARD, VILLEURBANNE
Marc LEMAIRE / UNIVERSITY OF LYON, 1 RUE VICTOR GRIGNARD, VILLEURBANNE

PURPOSE OF THE ABSTRACT

Surfactants are widely used in detergency, cosmetics, and pharmaceuticals as well as additives in paints, textiles, and food. Among surfactants, renewable surfactants are now occupying an important place.[1,2] The stability of non-ionic surfactants can be largely influenced by the type of linkages. There is a demand for robust surfactants for the application of cosmetics, oil field extraction and eco-extraction. In order to increase the stability of surfactants, many efforts have been devoted in our group to synthesize ether compounds.[3,4] Another way to increase the stability is to link the polar head and the non-polar part through a robust C-C bond. Such species were prepared by direct aldolization of ketoses such as dihydroxyacetone[5] and fructose.[6]. Based upon these results, we envisioned that diglycerol could be oxidized to a ketose-like product that could be used to prepare renewable surfactants.

The selective oxidation of alpha,alpha-diglycerol has been studied using oxygen as a clean oxidant in the presence of a palladium-based catalyst to give almost full conversion of diglycerol with 93% NMR yield (up to 76% isolated yield).[7] The product was named "diglycerose" considering that it mainly exists as a cyclic hemi-ketal form. The oxidation of alpha,beta-diglycerol gave a similar compound with 76% isolated yield. Diglyceroses will be used as building-blocks to prepare renewable surfactants.

FIGURES

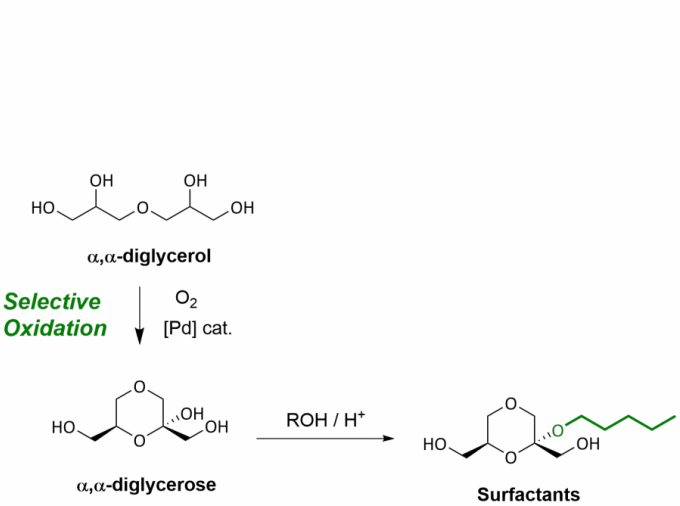

FIGURE 1

Figure 1.

Selective oxidation of diglycerol towards biobased surfactants

FIGURE 2

KEYWORDS

Diglycerol | Selective oxidation | Diglycerose | Surfactants

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