

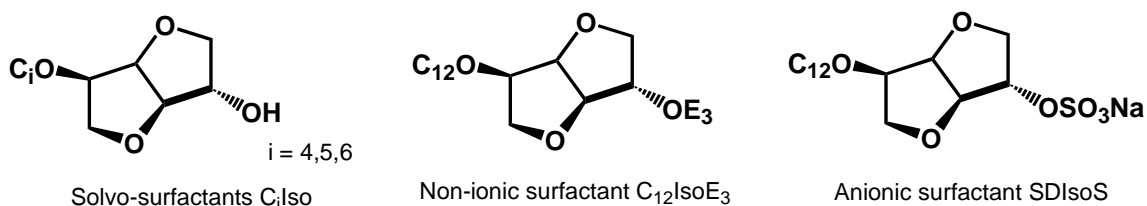
# ISOSORBIDE: A “SUSTAINABLE DIOL” DERIVED FROM SORBITOL FOR THE SYNTHESIS OF NEW AMPHIPHILES

Valérie Molinier\*, Ying Zhu, Morgan Durand and Jean-Marie Aubry

LCOM - UMR CNRS 8009 - Oxydation et Physico-Chimie de la Formulation,  
Ecole Nationale Supérieure de Chimie de Lille, F-59652 Villeneuve d'Ascq, France,  
[\\*Valerie.Molinier@univ-lille1.fr](mailto:Valerie.Molinier@univ-lille1.fr)

Isosorbide (1,4:3,6-dianhydro-D-glucitol) is readily obtained from sorbitol via a double dehydration and is thus an important product of the starch industry. Mono- and dinitroisosorbide are derivatives used for their vaso-dilating properties and dimethylisosorbide (DMI) is a co-solvent already on the market for cosmetic applications mainly.

In the present work, isosorbide has been used as a polar synthon for the design of various new amphiphilic species (figure 1).



**Figure 1:** Amphiphilic derivatives of isosorbide under study

The amphiphilic and hydrotropic properties of the short-chain monoalkyl derivatives (C<sub>i</sub>Iso) have been evaluated. These compounds appear to be efficient “solvo-surfactants”<sup>1,2</sup> and could find applications in a wide variety of industrial fields, as for instance the detergent industry. Isosorbide has also been evaluated as a linker building block for the synthesis of two “elongated” surfactants, a non-ionic one (C<sub>12</sub>IsoE<sub>3</sub>) and an anionic one (SDIsoS). The insertion of an isosorbide moiety between the lipophilic tail and the hydrophilic tail reveals to have a limited impact in the case of C<sub>12</sub>IsoE<sub>3</sub>, as regards to the phase behaviour in water, whereas SDIsoS exhibits very good foaming properties, in comparison with the widely-used sodium dodecyl sulfate (SDS).

<sup>1</sup> Bauduin, P., Renoncourt, A., Kopf, A., Touraud, D., Kunz, W. *Langmuir* **2005**, *21*, 15, 6769-6775.

<sup>2</sup> Zhu, Y., Durand, M., Molinier, V., Aubry, J.-M. *Green Chem.* **2008**, *10*, 532-540.