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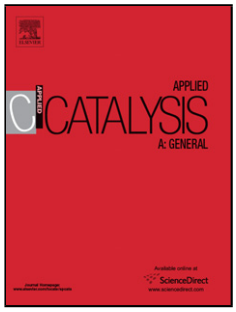

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Palladium-Catalyzed Hydroamination of Farnesene – Long Chain Amines as Building Blocks for Surfactants Based on a Renewable Feedstock

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Graphical Abstract

Highlights

- First hydroamination of β-farnesene using homogeneous catalysts
- Wide substrate scope for amines, compatible with this reaction
- Synthesis of surfactants, based on farnesylamines and evaluation of their surface activity

Abstract: Long chain amines are of great importance for industrial chemistry as they are precursors for surfactants like amine oxides or quaternary ammonia compounds. The atom efficient, homogeneously catalyzed hydroamination using 1,3-dienes offers linear linkage of the amine group to renewables like β-farnesene, offering a C_{15} skeletal structure, which is a desired size for surfactants, the so called *laurics*.

The presented paper describes the development of a catalytic system for the hydroamination of the industrially available terpene β-farnesene in good to excellent yields. The reaction works with a broad range of amines, aliphatic and aromatic ones. Furthermore, functionalities, like alcohol or ether groups, are tolerated, yielding functionalized farnesylamines. With two model nucleophiles, a scale-up to a 5,000 mL reactor was accomplished; the obtained products were functionalized to surfactants and afterwards characterized by their surface activity.

Keywords: *Hydroamination; Palladium; Homogeneous Catalysis; Renewables; Terpenes; Surfactants*

1. Introduction

Amines are widely used within the chemical industry.[1] Besides their use as a building block for polymers (*e.g.* polyamides) or fine chemicals, like pharmaceuticals, they play an important role as