β-Hydroxyalkylation of Sterically Hindered Phenols with Epoxides in Acid Medium

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Received March 11, 2010

Abstract—Reactions of 2,6-dialkylphenols with ethylene oxide, propylene oxide and epichlorohydrin in the presence of $SnCl_4$ at the temperature from –5 to +5°C leads to the formation of respective phenols containing a hydroxy group in the β-position of the aliphatic chain of the *para*-substituent. The conditions for maximum selectivity of the reaction of 2,6-di-*tert*-butylphenol with ethylene oxide were determined. By HPLC–MS method the directions of the side reactions were explored. The method has been successfully tested in a pilot installation. With 2,6-dimethylphenol instead of 2,6-di-*tert*-butylphenol a sharp increase occurs in the content of ethers in the reaction product. With epichlorohydrin, 2,6-di-*tert*-butylphenol affords a product, which is easily converted into an epoxide containing a sterically hindered phenol in its structure.

DOI: 10.1134/S1070363211020125