Regiochemistry and mechanism of oxidation of N-benzyl-N-alkylhydroxylamines to nitrones. Hassan, Azfar; Wazeer, Mohammed I. M.; Saeed, Mohammed T.; Siddiqui, Mohammad N.; Ali, Sk. Asrof. Chemistry Department, King Fahd University of Petroleum and Minerals, Dhahran, Saudi Arabia. Journal of Physical Organic Chemistry (2000), 13(8), 443-451. Publisher: John Wiley & Sons Ltd.

Abstract

The oxidn. of various N-(o-, m-, p-substituted benzyl)-N-alkylhydroxylamines and their dideuteriobenzyl (PhCD2) counterparts was carried out using mercury(II) oxide and p-benzoquinone (p-BQ) as oxidants. An overwhelming preference for the formation of conjugated nitrones is obsd. in the oxidn. of N-benzyl-N-isopropylhydroxylamines. Considerable intra- and intermol. kinetic isotope effects and neg. p values in the Hammett plots point towards a mechanistic pathway that involves electron transfer from nitrogen to the oxidant followed by hydrogen abstraction. The conformation of unstable (E)-nitrones, which readily isomerize to the more stable (Z)-nitrones, is deduced from 1H NMR data. The E .dblharw. Z isomerization was found to be a bimol. process.