

Redox Reaction in the Cyclization-aromatization of (*R*)-(+)-Citronellal with FeCl₃/Acetic Anhydride

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ABSTRACT

The effects of temperature, time of reaction, and the reactants mole ratio on the cyclization-acetylation of (*R*)-(+)-citronellal with FeCl₃/acetic anhydride were studied. Isopulegyl acetate (IPA) and neoisopulegyl acetate (NIPA) were obtained as the main products at room temperature (mole ratio of citronellal: acetic anhydride: FeCl₃ = 6:12:1). Both products are relatively fixed after the 30th minute. The average concentration of IPA at 30-180 minutes was 44.71%, while the average concentration of NIPA was 28.47%. Increasing temperature (80 °C) and the amount of acetic anhydride (mol ratio 2:6:1) gave *p*-cymene (17.53%) and citronellyl acetate (11.31%). Autoredox reaction on the transformation of citronellal into *p*-cymene and citronellyl acetate was studied with the carbon oxidation number concept.

Key words: (*R*)-(+)- citronellal, cyclization-aromatization, FeCl₃, *p*-cymene, redox