FORMATION OF DERIVATIVES OF 2H-IMIDAZOLE 1,3-DIOXIDE AS A RESULT OF THE REACTION OF 1,2-CYCLOHEXANEDIONE DIOXIME AND o-BENZOQUINONE DIOXIME WITH ACETONE

L. B. Volodarskii and V. A. Samsonov

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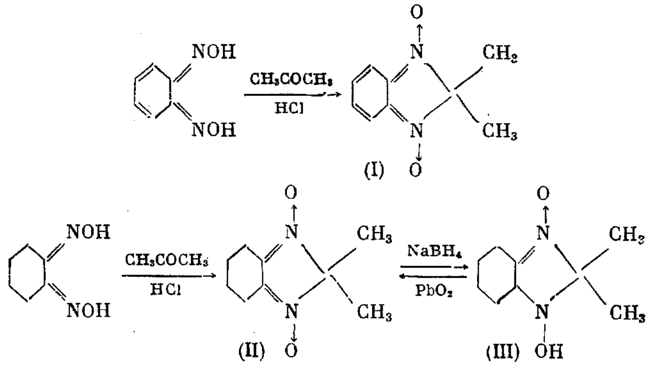
The heating of o-benzoquinone dioxime and 1,2-cyclohexanedione dioxime with acetone in the presence of 5% HCl results in the formation of ~60% yields of 2,2-dimethyl-2H-benzimidazole 1,3-dioxide (I), [1, 2] and 2,2-dimethyl-4,5,6,7-tetrahydro-2H-benzimidazole 1,3-dioxide (II), mp 160-162°C. IR spectrum (CCl_4, ν, cm^{-1}): 1590 (C=N), 1290 (N–O). UV spectrum (ethanol), λ_{max}, nm (log ε): 212 (3.90), 350 (3.90). PMR spectrum ($CDCl_3$, δ, ppm): 1.7 ($2CH_3$), 2.0 ($2CH_2$), 2.6 ($2CH_2$). This reaction apparently has a fairly general character and permits the synthesis of diverse 2H-imidazole 1,3-dioxides:



The reduction of II by $NaBH_4$ results in the formation of 1-hydroxy-2,2-dimethyl-4,5,6,7-tetrahydrobenzimidazoline 3-oxide (III), which is identical to the condensation product of N-(1-oximino-2-cyclohexyl)-hydroxylamine with acetone [3]. Dioxide II is regenerated upon the oxidation of III by PbO_2. The results of the elemental analysis of II coincide with the calculated data.

LITERATURE CITED

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