FORMATION OF COMBINED IMINODIHYDROFURANE RINGS FROM CYANOACETYLENE ALCOHOLS

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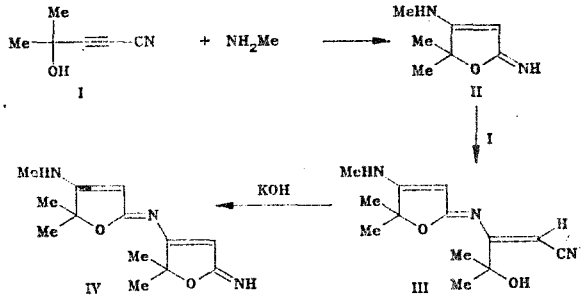
We have found that 2-(2-imino-5,5-dimethyl-2-5-dihydrofuryl-4)imino-4-methylamino-5,5-dimethyl-2,5-dihydrofurane (IV) can be obtained easily by the reaction of the tertiary cyanoacetylene alcohol I with a primary amine [1], followed by treatment of the resulting iminodihydrofurane II with alcohol I to form 2-(3-methyl-3-hydroxy-1-cyano-1-butenyl-2)imino-4-methylamino-5,5-dimethyl-2,5-dihydrofurane (III), mp 130-132°. IR spectrum ($CDCl_3$): 1622 (C=CH), 2220 (C=N), 3440 (> NH), 3590 cm^{-1} (OH). Further heterocyclization of the acrylonitrile derivative III to the bis-2,5-dihydrofurane IV was carried out in the presence of a catalytic amount of KOH in a protonic solvent.



The yield of bis-2,5-iminodihydrofurane IV is 98%, yellow crystals, mp 46-48° (from methanol). IR spectrum ($CDCl_3$): 1640 (C=CH), 1670 (C=N), 3280-3300 (=NH), 3340 cm^{-1} (>NH). Nitrile and hydroxyl absorption bands are absent. PMR spectrum ($CDCl_3$, δ, ppm): 5.41 (s, 1H, =CH), 4.77 (s, 1H, =CH), 2.80 (s, 3H, CH_3), 1.47 (s, 6H, $2CH_3$), 1.37 (s, 6H, $2CH_3$). The elemental composition data agreed with the calculated values.

This reaction sequence opens an approach to a synthesis of new polyheteroconjugated systems consisting of iminodihydrofurane units.

LITERATURE CITED

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