OXIDATION OF OXAZOLIDINES BY CARBONYL COMPOUNDS

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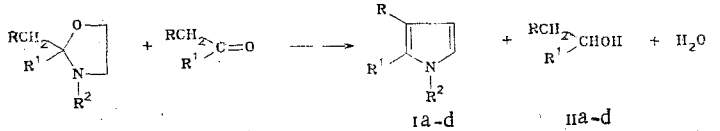
It is known that oxazolidines and carbonyl compounds undergo an exchange reaction that is accompanied by the formation of new oxazolidines and carbonyl compounds in the presence of acidic catalysts [1].

We have observed that redox processes that lead to the reduction of the ketones and aldehydes to the corresponding alcohols and to the formation of pyrrole derivatives as the final products of oxidation of the oxazolidines occur in the reaction of these compounds under alkaline-catalysis conditions:



Ia-d IIa-d

a $R+R^1=(CH_2)_5$, $R^2=CH_2CH_2OH$; b $R+R^1=(CH_2)_4$, $R^2=CH(CH_3)_2$; c $R=C_2H_5$, $R^1=C_3H_7$, $R^2=CH_2CH_2OH$; d $R=CH(CH_3)_2$, $R^1=H$, $R^2=C_4H_9$

A 0.1-mole sample of the oxazolidine was heated to 150-200°C with 0.02-0.05 mole of KOH, and 0.1 mole of the carbonyl compound was added in the course of 5-8 h. Vacuum distillation yielded alcohols IIa-d and pyrroles Ia-d.

The following pyrroles were synthesized [yields, boiling points (pressure), and n_D^{20} and d_4^{20} values given]: 1-(2-hydroxyethyl)-2,3-pentamethylenepyrrole (Ia), 54%, 138-140°C (4), 1.5408, and 1.0652; 1-isopropyl-2,3-tetramethylenepyrrole (Ib), 57%, 113-115°C (19), 1.5130, and 0.9568; 1-(2-hydroxyethyl)-2-propyl-3-ethylpyrrole (Ic), 41%, 109-111°C (2.7), 1.5038, and 0.9676; 1-butyl-3-isopropylpyrrole (Id), 27%, 66-68°C (2.7), 1.4701, and 0.8639.

The compositions and structures of pyrroles Ia-d were confirmed by the results of elementary analysis and data from IR and PMR spectroscopy.

The physicochemical constants and IR spectra of alcohols IIa-d, which were isolated in 84-91% yields, and genuine preparations were identical.

LITERATURE CITED

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