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THE PSEUDO-GOMBERG REACTION OF 4-AMINOPYRIDINE N-OXIDE

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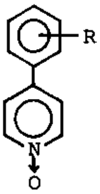
As an extention of work on the introduction of carbon substituents into the 4-position of pyridine ring$^{1)}$, we examined the psuedo-Gomberg reaction of 4-aminopyridine N-oxide and found that treatment with aromatic hydrocarbons and amyl nitrite in acetic acid afforded the corresponding 4-arylpyridine N-oxides (1 and 2) in generally good yields. Reactions with mono-substituted benzene gave 4-(o-substituted-phenyl)pyridine N-oxides as the main products, except for that with nitrobenzene in which the p-nitrophenyl derivatives was dominant. The 1-oxido-4-pyridyl radical in these reactions was shown to have a rather electrophilic character by caluclations of relative rates (e.g., $K_{PhOMe}/K_{PhH}=1.8$, $K_{PhNO_2}/K_{PhH}=0.11$). On the other hand, o-substituted products were obtained as the sole products in reaction of furan, thiophene and N-methanesulfonylpyrrole (3).

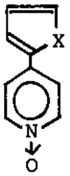
1



R: H, Me, OMe, Cl, NO_2, CN.

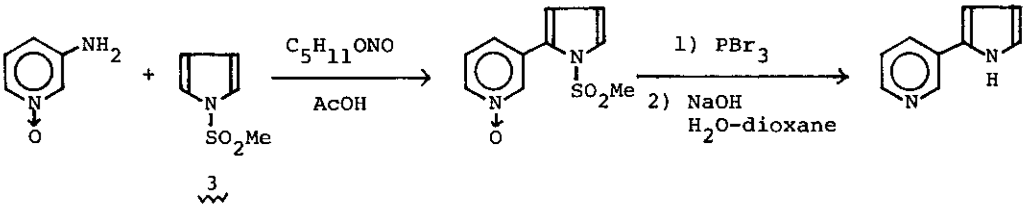
39-85%

2



X: O, 39.3%
S, 93.5%
N-SO_2Me, 50%

Whereas aminopyridines resist the reaction with 3, 2- and 3-aminopyridine N-oxides also readily reacted with 3. Thus, we succeeded in the simple synthesis of nornicotyrine in the overall yield of 50% as shown below.



1) M. Hamana et al., Heterocycles, 11, 371 (1978).

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