# REACTIONS OF N-AMINOPYRIDINIUM SALTS AND THEIR REDUCTION PRODUCTS
## ——— THEIR FUNCTION AS A NEW $NAD^+$-NADH MODEL COMPOUND ———

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1,4-Dihydropyridine ring system is biologically important since it occurs in the reduced form of $NAD^+$. And 1,4-dihydropyridine should also be proved useful in the preparation of interesting heterocyclic compounds.

In this paper, we wish to make a report of a new NADH model compound which has N-amino group.

The reduction of N-methylacetamidopyridinium derivatives 1 with $Na_2S_2O_4$ gave dihydropyridines 2, which were reversibly oxidized to pyridinium salts 1 with 2,3-dichloro-5,6-dicyano-p-benzoquinone(DDQ), 2,6-dichlorophenolindophenol, etc. in quantitative yields.

Dihydropyridines 2 were transformed into pyridines 3 in quantitative yields by heating or irradiation with 400W high pressure mercury lamp.

Reaction of dihydropyridines 2 (also NADH) in acid have been difficult to study because a complex mixture of compounds was formed. In order to investigate this problem, we examined the reaction of α-substituted dihydropyridines 2 in acid and found that it gave ring opening products 4.

1,4-Dihydropyridines are expected to have an enamine-like reactivity, so we examined the reaction of dihydropyridines 2 with electrophiles. For example, the reaction of 2 with 2,4-dinitrobenzenesulfenylchloride afforded 3,5-disubstituted dihydropyridine 5, which was transformed into 3,5-disubstituted pyridine 6 by heating.

Finally, we also discuss about biological effects of these compounds by using E, Coli inner membrane.