A STUDY OF THE PHYSICAL CHEMISTRY
OF PICOLINIC AND ISONICOTINIC ACIDS
AND THEIR AMIDES

by

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GENERAL INTRODUCTION

Reactions which are catalysed by mineral acids and alkalies are fairly common and investigations aimed at elucidating the mechanism of such reactions are of considerable practical and theoretical interest.

The hydrolysis of amides has received some attention, particularly the acid hydrolysis of acetamide and benzamide. Mechanisms for the hydrolysis of these amides have been put forward by a number of workers. There is, however, considerable disagreement especially over the explanation of the behaviour of rate constants in the region of higher mineral acid concentration. It is of particular interest to note that whereas the rate constants of acetamide and benzamide pass through a maximum in the range of acid concentration between 3N - 4N, Jellinek and Gordon have shown that the heterocyclic amide nicotinamide behaves quite differently. It was this difference in behaviour which led to the work described here. It was considered of interest to know whether the difference was general for heterocyclic amides and at the same time to know what would be the effect of substitution at different positions in the pyridine ring.

The work is set out in three parts. Firstly, the polarography is described since this was the method used to measure the change in concentration during the kinetic experiments. A method of analysis was developed, based on the fact that the acid does not give a wave under alkaline conditions whereas the corresponding amide does so under the same conditions.

Secondly, the kinetic study of the acid hydrolysis of
picolinamide and isonicotinamide is described. Two appendices giving
the details of the examination are attached to this section.

In the third part the measurement of the dissociation
constants of both acids and their amides is described. The measure-
ments were made by examining the ultra-violet absorption spectra of
their solutions in various concentrations of hydrochloric acid.
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