

Stability of nucleotide under geological conditions : temperature and phosphate concentration dependence

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Among previous studies, results from Ponnampereuma et al. (1965) are considered as the standard model to produce the first RNA. Ponnampereuma et al. (1965) reported that nucleotide is produced by heating nucleoside mixed with phosphoric acid at 160 degrees for 2 hours. On the other hand, there exists a report that heating experiment of the nucleotide at 160 degrees resulted in decomposition in a few minutes (Kawamura, 1998). These results are conflicting each other and creating ambiguity as to which is true.

In this study, We performed experiments with heating nucleotide and nucleoside under the various conditions to examine the above problem. It is found that nucleotide easily decompose in all conditions if the temperature exceed 160 degrees. This result supports the Kawamura's result. On the other hand, we succeeded first time producing the nucleotide under the low temperature conditions like 25 degrees or 80 degrees. In addition, We found that nucleoside are not phosphorized in concentrated phosphoric acids. Existence of water promotes synthesis of nucleotide by phosphorization of nucleoside, etc.