
The exploration of the effect of gamma radiation on primordial formamide-based solutions

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Abstract

Primordial radioactivity might have been an important source of energy for various chemical transformations. Intensity of endogenous radioactivity on early Earth was up to 3.6103 higher than today and chemical substances in contact with radioactive rocks should undergo radiolysis. In this manner, we expect also transformation of molecules relevant to prebiotic chemistry. In this study, we present a pioneering research focused on the influence of ionising gamma radiation on formamide and we are exploring its possible influence on formation of prebiotic molecules or biomolecules. We demonstrate that the irradiation of formamide mixed with various clays by ~ 6 kGy produces significant amounts of urea. Urea can play a role in subsequent chemical transformations resulting in the formation of basic substances of genetic code or amino acids.

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