ASSESSING THE PREBIOTIC IMPORTANCE OF THIOESTERS AND AQUEOUS METALS

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Thioesters are thermodynamically-activated derivatives of carboxylic acids that have been implicated as potentially important to the origin of life on Earth. This presentation will evaluate the feasibility of a "Thioester World"—most famously championed by Christian de Duve— from the standpoint of the kinetics of chemical reactions involving thioesters and related compounds (e.g., dithioesters, thiocarbonates, and thiocarbamates). We are specifically interested in assessing whether productive reactions of thioesters (to build complexity) could have outpaced destructive reactions under prebiotic conditions. Our data and analysis focus on organic reactions in water, over a wide pH range, in the presence of aqueous metal ions relevant to the prebiotic ocean.