Synthesis, Characterization and Photochemistry of Cyanopolyynes: Model for Photoreactivity of the Interstellar Medium

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As of today, some 150 molecules have been identified in the interstellar Medium. Among the molecules detected in the ISM, the cyanopolyynes are very important since they are the essential constituents in building block amino acids. It is known that a rich organic chemistry takes place within and on grain mantles, essentially constituted of water, and contributes to the evolution of molecular diversity in the interstellar medium. Within the solar system, nitrile chemistry is particularly relevant to Titan. These cyanopolyynes are dominant atmospheric molecules on Titan. Models predict polymerized cyanopolyynes form larger aerosol aggregates and rain down on to the surface of Titan containing methane/ethane lakes and water ice.

This talk will present photochemical processes of larger cyanopolyyne formation from small precursor molecules, isolated in rare-gas matrices. The photoreactivity of the cyanopolyynes with acetylene and photoreactivy of C_4N_2 trapped in water-ice will also be presented.