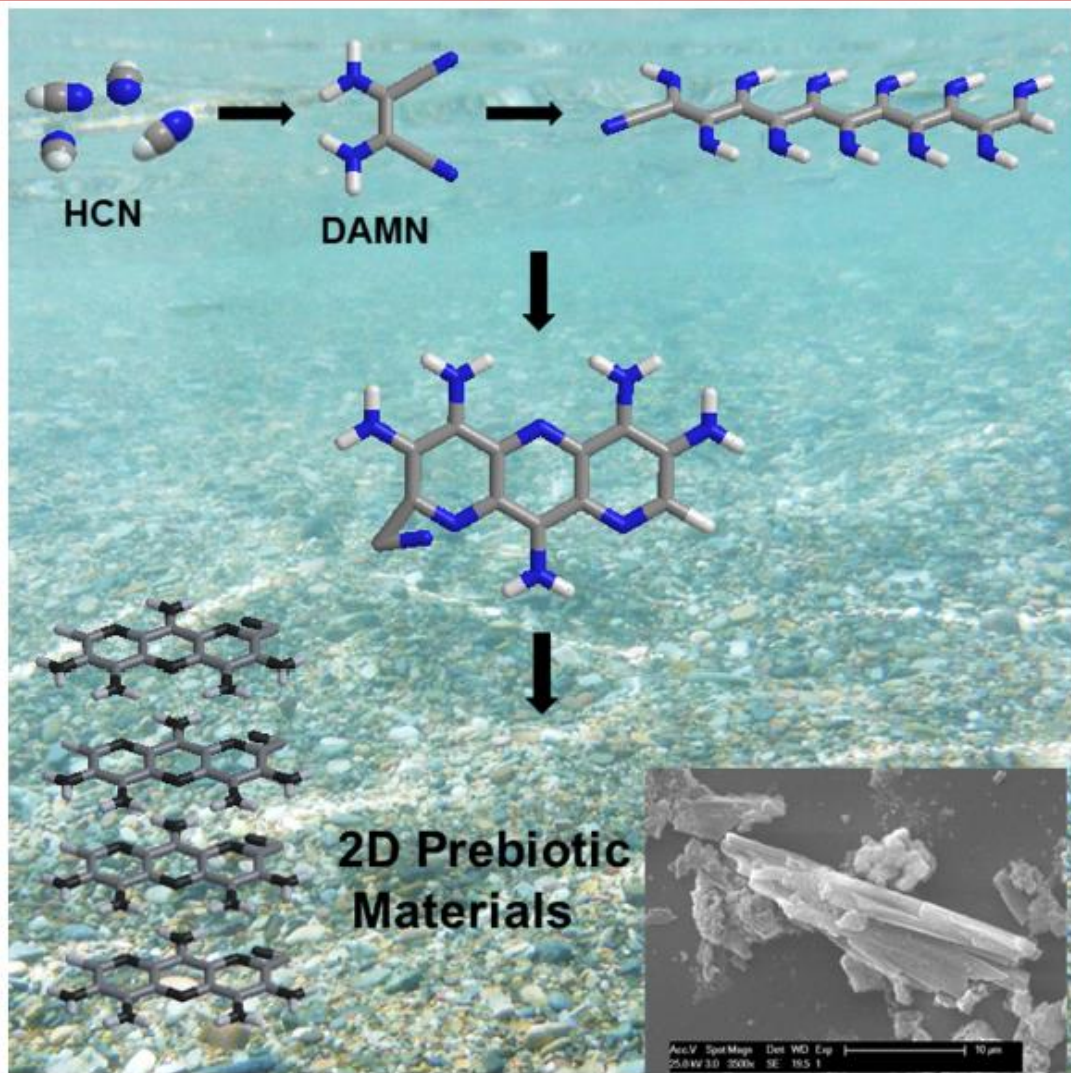


A comparative study on HCN polymers synthesized by polymerization of NH_4CN or diaminomaleonitrile in aqueous media: **New perspectives for prebiotic chemistry and materials science**



HCN polymers are a group of complex and heterogeneous substances that are widely known in the fields of astrobiology and prebiotic chemistry. In addition, they have recently received considerable attention as potential functional material coatings. However, the real nature and pathways of formation of HCN polymers remain open questions. It is well established that the tuning of macromolecular structures determines the properties and practical applications of a polymeric material. Herein, different synthetic conditions were explored for the production of HCN polymers from NH_4CN or diaminomaleonitrile in aqueous media with different concentrations of the starting reactants and several reaction times. By using a systematic methodology, both series of polymers were shown to exhibit similar, but not identical, spectroscopic and thermal fingerprints, which resulted in a clear differentiation of their morphological and electrochemical properties. New macrostructures are proposed for HCN polymers, and promising insights are discussed for prebiotic chemistry and materials science on the basis of the experimental results.

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