

Abstract

Synthesis and Characterisation of Dimeric Bolaamphiphilic Dehydrodipeptides for Biomedical Applications [†]

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Abstract: The self-assembly of nanometric structures from molecular building blocks is an effective way to make new functional materials for biological and technological applications. In this work, we synthesized new dimeric bolaamphiphilic dehydrodipeptides, containing phenylalanine connected to a dehydroamino acid residue at the C-terminus. The N-terminus of the dipeptide was connected to both ends of a bifunctional central aromatic moiety, namely 1,4-benzenedicarboxylic acid and 1,3-benzenedicarboxylic acid. The potential use of these new compounds as hydrogelators was evaluated. The results showed that these synthesised compounds behave as efficient molecular hydrogelators, forming hydrogels with minimum gelation concentrations of 0.3–0.8 wt%. The self-assembly of these hydrogelators was investigated by the STEM microscopy technique, revealing different shapes depending on the N-aromatic moiety. STEM microscopy revealed that the hydrogels are composed by fibers, ribbons and even spheres. Circular dichroism spectroscopy was also performed in order to evaluate the aggregation of the peptides into characteristic secondary structures.

Keywords: Dehydrodipeptide; hydrogels; bolamphiphiles; hydrogelators; supramolecular; self-assembly

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