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Sol-gel transition behavior of aqueous peptide-amphiphile (C16-W3K) solutions: effects of alkyl-tail length, mechanical shear, temperature, and salt[1] MASASHI YAMAMOTO, TAKAHIRO OTSUKA, YOSHINORI ORIMO, TOMOKI MAEDA, ATSUSHI HOTTA, Department of Mechanical Engineering, Keio University — Peptide amphiphiles (PA) possess nanoscale micelle structures and excellent biocompatibility. In aqueous PA solution, PA molecules can self-assemble through various configurations into spherical and wormlike micelles, which can occasionally form hydrogels. C16-W3K is one of the unique PA, whose micelle configurations can transfer from spherical to wormlike structures in its aqueous solution over time, while the wormlike micelles could also lead to gelation. In our recent research, the effects of the length of the hydrophobic alkyl tail and other external factors of C16-W3K on the gelation behavior of the C16-W3K solution have been discussed. It has been revealed that longer alkyl-tails could facilitate the gelation of the C16-W3K solution, and that the external stimuli, such as mechanical shear and heat, could promote faster gelation of the C16-W3K solution. It was also found that salt could adjust the pH of the C16-W3K solution, having profound influence on the gelation behavior of the C16-W3K solution. In fact, the gelation of the C16-W3K with a higher storage modulus could be obtained from relatively acidic solutions, while the gelation of the C16-W3K solution was firmly suppressed in highly basic solutions.

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