EuroSciCon

10th Edition of International Conference on

Biopolymers & Bioplastics

May 29-30, 2019
Singapore

Ji-Heung Kim, Polym Sci 2019, Volume 5

Preparation of poly(N-2,3-dihydroxypropyl aspartamide) (PDHPA) and the crosslinked hydrogel for various functional applications

Ji-Heung Kim

School of Chemical Engineering, Sungkyunkwan University, Korea

In this work, the preparation and characterization of new multi-hydroxy polymer, poly(N-2,3-dihydroxypropyl aspartamide) (PDHPA), and the crosslinked gels were discussed. As a poly(amino acid) with peptide backbone having pendent 1,2-dihydroxy functional groups, PDHPA was synthesized from polysuccinimide, the thermal polycondensate of aspartic acid, by aminolysis reaction using 3-amino-1,2-propanediol. This polyaspartamide derivative has several valuable properties including biodegradability, high water solubility, biocompatibility, strong adhesiveness, and relatively simple synthetic method. Due to its unique chemical structure, PDHPA can provide a useful platform to combine with other molecules and also to prepare the chemical and physical hydrogels. The PDHPA is reacted with boric acid (H3BO3) to provide a transparent, pH-dependent reversible gel with instant self-healing property. In addition, PDHPA and the crosslinked gel exhibited a relatively strong adhesion toward various kinds of substrates including glass, cellulosic, metal and some plastics. On the other hand, the chemical gel was prepared by using glutaraldehyde as the crosslinker in the presence of acid catalyst to provide a mechanically strong gel membrane. With the non-cytotoxic biocompatible nature, the PDHPA and derivative hydrogel may find useful applications in various industrial and biomedical fields.

Biography

Ji-Heung Kim is a professor of Chemical Engineering at Sungkyunkwan University since 1992. He received BS from Seoul National University, MS from KAIST, and PhD from Rensselaer Polytechnic Institute, USA in 1991. He was postdoctoral research associate at the UMASS Amherst, USA. He spent one year as a visiting scientist at the Science University of Tokyo (Japan) in 1997, and at the University of Queensland (Australia) in 2005. He served as editorial member and editor-in-chief of Polym-Korea journal (2007~2012). His current research focused on the synthesis of novel functional polymers, smart hydrogel materials, and bio-inspired adhesive polymer & gel for various biomedical and engineering applications. He has published more than 150 papers in reputed journals.

kimjh@skku.edu