Importance of Zwitterionic Incorporation into Polymethacrylate-Based Hydrogels for Simultaneously Improving Optical Transparency, Oxygen Permeability, and Antifouling Property

Jiang Wu[#], Chaochao He[#], Huacheng He^{*}, Chaoqun Cheng, Junyi Zhu, Zecong Xiao, Hongyu Zhang, Xiaokun Li, Jie Zheng^{*}, and Jian Xiao^{*}

Dr. J. Wu, C. He, C. Cheng, J. Zhu, Z. Xiao, H. Zhang, Prof. X. Li, Prof. J. Xiao* School of Pharmaceutical Sciences, Key Laboratory of Biotechnology and Pharmaceutical Engineering, Wenzhou Medical University, Wenzhou, Zhejiang, 325035, China E-mail: <u>xfxj2000@126.com</u>

Dr. H. He* College of Chemistry and Materials Engineering, Wenzhou University, Wenzhou, Zhejiang, 325027, China Email: <u>hehc@wzu.edu.cn</u>

Prof. J. Zheng* Department of Chemical and Biomolecular Engineering, The University of Akron, Akron, Ohio 44325, USA Email: <u>zhengj@uakron.edu</u>

Keywords: Zwitterionic; Hydrogel; Oxygen Permeability; HEMA; Biocompatibility



Figure S1. Swelling behavior of series HEMA-SBMA hydrogels (HEMA; HEMA: SBMA: 0.70:0.05; HEMA: SBMA: 0.65:0.10; HEMA: SBMA: 0.55:0.20; HEMA: SBMA: 0.45:0.30; HEMA: SBMA: 0.35:0.40). (A & B): Top view of HEMA-SBMA hydrogels before and after swelling. (C & D): Side view of HEMA-SBMA hydrogels before and after swelling. (E): Swelling ratio vs. time data for various HEMA-SBMA hydrogels. The standard deviation for all data is averaged from three replicates.



Figure S2. (A) Typical images of HEMA hydrogels when water dehydrated from the gel (60 ° C). (B) Water content (wt. %) and optical transmittance (%) changes of HEMA hydrogel during dehydration process.



Figure S3. (A) Series HEMA-SBMA hybrid hydrogels water loss ratio versus time. (wt. % versus total hydrogel amount). (B) Series HEMA-SBMA hybrid hydrogels water swelling ratio versus time. (wt. % versus total hydrogel amount). (C) Series HEMA-SBMA hybrid hydrogels dehydration behavior of normalized water loss ratio (wt. % versus total water content) varied with time. (D) Series HEMA-SBMA hybrid hydrogels hydration behavior of normalized water content) varied with time. The standard deviation for all data is averaged from three replicates.



Figure S4. Statistical pore sizes measured by Image J. Size distribution diagram display respectively. (A) HEMA as control. (B) HEMA: SBMA. 0.70:0.05. (C) HEMA:SBMA 0.65:0.10. (D) HEMA:SBMA 0.55:0.20. (E) HEMA:SBMA 0.45:0.30. (F) HEMA:SBMA 0.35:0.40.