

## Affinity functionalization of PVA-co-PE nanofibrous membrane with Ni(II)-chelated ligand for bovine hemoglobin adsorption

Hao Zhang<sup>a</sup>, Wenwen Wang<sup>ab\*</sup>, Mufang Li<sup>ab</sup>, Zhentan Lu, Ke Liu<sup>ab</sup>, Yuedan Wang<sup>ab</sup>, Dong Wang<sup>abc\*</sup>

<sup>a</sup>School of Materials Science and Engineering, Wuhan Textile University, Wuhan 430073, China

<sup>b</sup>Hubei Key Laboratory of Advanced Textile Materials & Application, Wuhan 430200, China

<sup>c</sup>College of Chemistry, Chemical Engineering and Biotechnology, Donghua University, Shanghai 201620, China

### Supplementary data

#### 1. Materials

Cyanuric chloride and iminodiacetic acid (IDA) were purchased from Aladdin. PP meltblown nonwoven fabric (18 g/m<sup>2</sup>) was purchased from U.S. Pacific Nonwovens & Technical Textile Technology Ltd. Bovine hemoglobin (Bhb) was purchased from Shanghai Yuanye Bio-Technology Co., Ltd, and it was stored at 4 °C. Cellulose acetate butyrate (CAB; butyryl content 44-48%) was purchased from Eastman Chemical Company. Poly(vinyl alcohol-co-ethylene) (PVA-co-PE; ethylene content 44 mol%) with a melt flow index of 5g/10min (190 °C/2.16 kg) was purchased from Aldrich Chemical Co. Inc. Nickel sulfate hexahydrate (NiSO<sub>4</sub>·6H<sub>2</sub>O) and all other solvents were purchased from Sinopharm Chemical Reagent Co., Ltd.

#### 2. Preparation of PVA-co-PE nanofibrous membrane and surface activation

PVA-co-PE nanofibers were prepared according to a previously published procedure<sup>[1]</sup>. Then PVA-co-PE nanofibers were dispersed in an aqueous solution with a high-speed shear mixer to form a stable suspension. The aqueous suspension was then coated onto the surface of PP substrates with high pressure airflow molding method to form nanofibrous membrane. Then the nanofibrous membrane was peeled off from the substrate and dried at room temperature for use. The square nanofibrous membranes with side length of 2 cm were prepared, and then they were activated by sodium hydroxide solution and cyanuric chloride according to a previously published procedure<sup>[2]</sup>.

#### 3. Characterization

---

\*Corresponding authors. Email: [wtuwang@126.com](mailto:wтуwang@126.com) (W.W. Wang), [wangdon08@126.com](mailto:wangdon08@126.com) (D. Wang).

Scanning Electron Microscopy (SEM, Sirion 200) was used to observe the morphologies of nanofibrous membranes. The surface chemical structures of membranes were investigated by Fourier Transform infrared spectroscopy (FTIR, Tensor 27, Bruker). The concentration of BHB in PBS solution was measured on a Shimadzu UV-2700 UV-vis spectrophotometer.

### **References**

- [1] Wang, D.; Sun, G.; Chiou, B. S., A High-Throughput, Controllable, and Environmentally Benign Fabrication Process of Thermoplastic Nanofibers. *Macromol Mater Eng* 2007, *292*, 407-414.
- [2] Wang, W.; Zhang, H.; Zhang, Z.; Luo, M.; Wang, Y.; Liu, Q.; Chen, Y.; Li, M.; Wang, D., Amine-functionalized PVA-co-PE nanofibrous membrane as affinity membrane with high adsorption capacity for bilirubin. *Colloids and Surfaces B: Biointerfaces* 2017, *150*, 271-278.