



## Applications of membrane technology in treating wastewater from the dyeing industry in China: current status and prospect

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### ABSTRACT

The membrane technology has become one of the promising techniques to promote cleaner production and emission reduction in the printing and dyeing industry. It is important to understand the current situation and prospect of membrane technology applications to treat wastewater from the dyeing industry, which provides comprehensive overview of wastewater treatment by the technology in the industry. The research history of the membrane technology applications in the dyeing industry was investigated by literature metrology with National Knowledge Infrastructure (CNKI) and Web of Science™ (SCI). A national survey was conducted to collect information of current applications and prospect, complemented by literature investigations. Results showed that: (1) the membrane technology was initially applied in recycling dyes and gradually was spread to treat and reuse wastewater. Three development stages of the research history are identified: pre-1998 (slow development), 1998–2008 (rapid growth), and 2009 to present (steady development). (2) China is leading in publishing SCI papers in related filed. The top domestic institutes include Donghua University, South China University of Technology, Dalian University of Technology, Zhejiang University, Zhejiang University of Technology, and Tianjin University. (3) By 2015, the total capacity of the membrane technology in dyeing wastewater treatment in China was about 662,000 m<sup>3</sup>·d<sup>-1</sup> and the number of applications was 128 (with capacity ≥500 m<sup>3</sup>·d<sup>-1</sup>). Geographical distribution is also analyzed and most applications are located in Zhejiang, Jiangsu, Guangdong, Fujian, and Shandong. (4) “Ultrafiltration (UF) + ‘reverse osmosis’ (RO)” was the most widely applied process of membrane technologies in dyeing wastewater treatment, the “membrane bioreactor (MBR) + RO” and “Continuous Membrane Filtration (CMF) + RO” were closely behind. The operational cost of membrane technology applications is relatively higher than that of conventional technology applications in the dyeing industry. However, the membrane technology treats wastewater more effectively and efficiently, and thus could provide reclaimed water for reuse. It is a promising and important technology in dyeing wastewater treatment and reuse in near future because of environmental stress, strict water management, increasing water price, decreasing membrane cost, and increasing life span of membranes.

*Keywords:* Membrane technology; Wastewater; China; Driving forces; Dyeing industry

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