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Hydrophobic hollow fibre membranes for membrane distillation

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009. This standard is proposed and managed by the National Separation Membrane Standardization Technical Committee (SAC/TC382). This standard was drafted. Delan Water Technology Co., Ltd., Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences, Dalian Chemistry, Chinese Academy of Sciences Institute of Physics, Xinjiang Water Treatment Engineering Technology Research Center Co., Ltd., Beijing Xinlin Water Technology Co., Ltd., Tianjin University of Science and Technology, Zhejiang Industrial University, Beijing Zhongke Ruisheng Resources and Environment Technology Co., Ltd., Tianjin Membrane Technology Co., Ltd., Beijing Xinyuan Guoneng Technology Group Co., Ltd., Zhejiang Dongda Environmental Engineering Co., Ltd., Tianjin Membrane Engineering Technology Co., Ltd. The main drafters of this standard. Zeng Fanfu, Wang Jun, Kang Guodong, Hou Deyin, Yan Yan, Aishan·Yu Suzhen, Yan Yanbin, Tang Na, Shen Jiangnan, Shi Zhiwei, Hu Xiaoyu, Chen Weiwen, Xu Baiyu, Jin Wangyong, Wang Wei, Liu Yang. Hollow fiber hydrophobic membrane for membrane distillation

1 Scope

China's national standard for hydrophobic hollow fibre membranes used in membrane distillation. It specifies the product model designation and the technical requirements. Membrane distillation is a separation driven by temperature rather than pressure, and it works because the membrane is hydrophobic: liquid water cannot enter the pores, but water vapour passes through freely. Hot feed on one side evaporates at the pore mouths, the vapour crosses, and it condenses on the cool side - so the process separates pure water from anything dissolved, at atmospheric pressure and at temperatures low enough to run on waste heat or solar. That makes it attractive for the streams reverse osmosis cannot handle: brines too concentrated for RO's osmotic pressure, and the zero liquid discharge duties that industrial water regulation increasingly demands. The property the standard must guarantee is the one the process depends on entirely - the membrane must not wet, because a wetted pore lets liquid through and the separation is lost.

This standard specifies the product model name and technical requirements for hollow fiber

hydrophobic membranes for membrane distillation (hereinafter referred to as "hollow fiber hydrophobic membranes"). Test methods, inspection rules, marking, packaging, transportation and storage. This standard applies to the development, production and application of hollow fiber hydrophobic membranes for membrane distillation. Flat hydrophobic membrane or other type of hydrophobic membrane Reference execution.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article. Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 191 packaging storage and transportation icon

GB/T 5750.5-2006 Standard Test Method for Drinking Water Standards Inorganic Non-Metal Indicators

GB/T 6682 Analytical laboratory water specifications and test methods

GB/T 20103 Membrane Separation Technology Terminology

GB/T 30447-2013 Nano film contact angle measurement method

GB/T 32361-2015 Separation membrane pore size test method Bubble point and average flow method HY/T 110-2008 Polypropylene hollow fiber microporous membrane

3 Terms and definitions

The following terms and definitions defined in GB/T 20103 apply to this document. For ease of use, the following is repeated Relevant terms and definitions in GB/T 20103.

3.1 Membrane distillation membraneistilation Using the difference in temperature between the two sides of the microporous membrane, the aqueous solution in contact with the hot side is vaporized on the surface of the membrane, and the generated water vapor passes through the membrane pore. It is passed to the cold side of the membrane and condensed into water to complete the separation process.

Note. The method is direct contact type, air interval type, decompression type or gas purging type. [GB/T 20103-2006, definition 6.2.6]

3.2 Hydrophobic membrane A membrane having a separation function made of a hydrophobic material.

3.3 Hydrophobic microporous membrane A hydrophobic membrane having a membrane average pore diameter of from 0.05 μm to 1.00 μm.

3.4 Maximum aperture maximumporediameter The diameter of a circular capillary equivalent to the largest aperture of the microporous membrane.

Note. Rewrite GB/T 20103-2006, definition 5.1.5.