

新規中性分子高除去 RO 膜の開発

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Development of New RO Membrane Having High Rejection for Small Neutral Substances (¹Toray Industries, Inc.) ○Hiroaki Tanaka,¹ Hiroki Minehara,¹ Yuya Maruo,¹ Shunsuke Tabayashi,¹ Takafumi Ogawa,¹ Takao Sasaki,¹ Shinichi Minegishi,¹

Reverse osmosis (RO) membranes are widely used in seawater desalination, ultrapure water production, drinking water production, etc. In these water treatment processes, removal of neutral substances contained in water resources is an important issue. In this study, by making full use of detailed structural analysis of the polyamide functional layer of the RO membrane from SEM/TEM images as shown in Fig. 1, we have succeeded in developed a new RO membrane element (TBW-HR) that achieves both high permeability and high removability. It was confirmed that this new RO membrane is excellent in removing neutral substances such as silica and *iso*-propanol (IPA), which are important removal targets in the production of ultrapure water used in electronic and semiconductor manufacturing, etc. (Fig. 2).

Keywords : Polyamide; Reverse Osmosis Membrane; Semiconductor; Ultrapure Water

逆浸透 (RO) 膜は海水淡水化、超純水製造、飲料水製造等で広く用いられており、これら水処理工程において、水資源中に含有される中性分子の除去は重要な課題となっている。本研究では、Fig. 1 に示すような SEM/TEM 像からの RO 膜のポリアミド機能層の詳細な構造解析を駆使することで、高透水性と高除去性を両立した新規 RO 膜エレメント (TBW-HR) の開発に成功した。得られた RO 膜は、特に電子・半導体製造等で用いられる超純水の製造において重要となる、シリカや IPA 等の中性分子除去性に優れることを確認した (Fig. 2)。

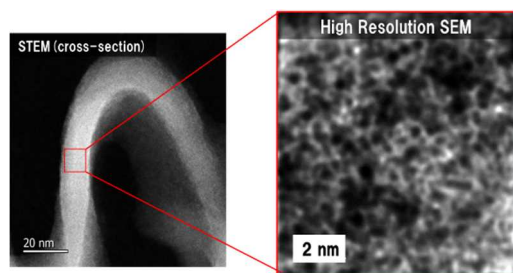
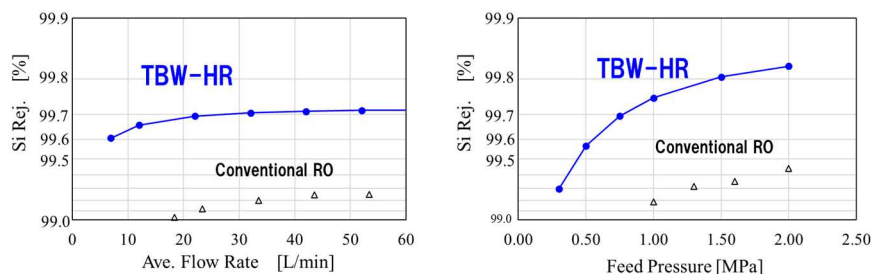


Fig. 1. Polyamide functional layer structure



conditions:

left : 0.75 MPa, 500 mg/L NaCl, 20 mg/L Silica, 0.5 mg/L Boron, Brine 20 L/min, 25°C, pH7

right : 500 mg/L NaCl, 20 mg/L Silica, 0.5 mg/L Boron, Brine 20 L/min, 25°C, pH7

Fig. 2. Si removal property of new RO membrane element (TBW-HR)