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**Hoek et al.**

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(54) **MICRO-AND NANOCOMPOSITE SUPPORT STRUCTURES FOR REVERSE OSMOSIS THIN FILM MEMBRANES**

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(21) Appl. No.: **11/927,521**

Alexandre, et al., "Polymer-layered silicate nanocomposites: preparation, properties and uses of a new class of materials," *Materials Science and Engineering*, 28:1-63 (2000).

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(Continued)

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**Related U.S. Application Data**

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(51) **Int. Cl.**  
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(57) **ABSTRACT**

Disclosed are compaction resistant thin film composite membranes having a porous polymeric support; a semi-permeable polymer film polymerized on the porous polymeric support; and particles, of a size in the range of microparticles and nanoparticles, dispersed in the porous polymeric support. Also disclosed are methods of making compaction resistant membranes by polymerizing a polymer film on a porous polymeric support with particles of a size in the range of microparticles and nanoparticles dispersed therein, the particles having been selected to improve flux flow characteristics over time of the semi-permeable membrane. Also disclosed are methods of purifying water using the disclosed membranes. This abstract is intended as a scanning tool for purposes of searching in the particular art and is not intended to be limiting of the present invention.

(52) **U.S. Cl.** ..... **427/245**; 210/500.38; 210/490; 210/502.1; 210/500.25

(58) **Field of Classification Search** ..... 210/502.1, 210/490, 500.38, 500.37, 652, 500.23, 500.41, 210/500.25, 500.26; 427/245; 428/246; 95/45, 51

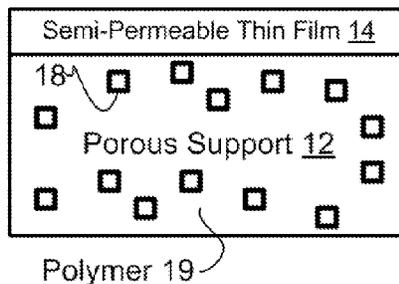
See application file for complete search history.

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**6 Claims, 17 Drawing Sheets**



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