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(54) **POLYBENZOXAZOLE POLYMER-BASED MIXED MATRIX MEMBRANES**

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(58) **Field of Classification Search** ..... None
See application file for complete search history.

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(57) **ABSTRACT**

The present invention discloses new types of polybenzoxazole-based mixed matrix membranes and methods for making and using these membranes. The polybenzoxazole-based mixed matrix membranes are prepared by fabricating a polyimide-based mixed matrix membrane by dispersing molecular sieve particles in a continuous aromatic polyimide matrix with pendent hydroxyl groups ortho to the heterocyclic imide nitrogen; and then converting the polyimide-based mixed matrix membrane to a polybenzoxazole-based mixed matrix membrane by heating between 200° and 600° C. under inert atmosphere or vacuum. The polybenzoxazole-based mixed matrix membranes of the present invention can be fabricated into any convenient geometry such as flat sheet (or spiral wound), tube, hollow fiber, or thin film composite. These polybenzoxazole-based mixed matrix membranes exhibit high thermal stability, significantly higher selectivity than the neat polybenzoxazole polymer membranes, and much higher permeability than traditional mixed matrix membranes.

14 Claims, No Drawings