

Nanoporous liquid-crystalline materials for water treatment membranes and ion transport electrolytes

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We describe our recent approaches to development of functional nanoporous liquid-crystalline (LC) materials for use as electrolytes¹⁻⁵, and water treatment membranes^{6,7}. Design of molecular shape, control of molecular interactions, and formation of nanostructures are key for the development of these functional materials. 1D, 2D, and 3D nanochannel structures have been obtained by self-assembly of the molecules. These channels show anisotropic, efficient, and selective transport properties. These structures have been fixed in the solid polymer films by in-situ polymerization of reactive LC molecules¹⁻³. Water treatment membranes have been obtained using nanoporous LC materials^{6,7}. Selective rejection of inorganic salts and virus removal have been achieved by these membranes.

References

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