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Cyclophane as conformationally twisted monomer in high performance polymers

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Abstract

Intrinsic microporosity in polymers is defined as "a continuous network of interconnected intermolecular voids, which forms as a direct consequence of the shape and rigidity of the component macromolecules" [1]. Our approach to maximizing intrinsic microporosity has been to design polymers with highly contorted molecular structures to provide "awkward" macromolecular shapes that cannot pack space efficiently. The major function of the formation of the vehicular mechanism is the existence of the free volumes within polymeric chains in proton exchange membrane which allow the transferring of the hydrated protons through the membrane.

[2.2]Paracyclophane is often considered the key compound of the cyclophane family, partly because of its ease of synthesis. The most important of these features are the electronic interaction of the closely stacked π systems and the high amount of molecular strain which manifests itself in the distortion of the benzene rings into a boat shape [2].

We have prepared microporous PBI networks via the polycondensation of a tetramine with a diacid monomer derived from [2.2]Paracyclophane.. The work cover the origin of the early work on PIMs, their synthesis and structural characterization, properties, and potential applications.

References

[1] Jenekhe, S. A.; Chen, X. L. *Science* **1999**, *283*, 372.
[2] Cram, D. J.; Cram, J. M. *Acc. Chem. Res.* **1971**, *4*, 204.