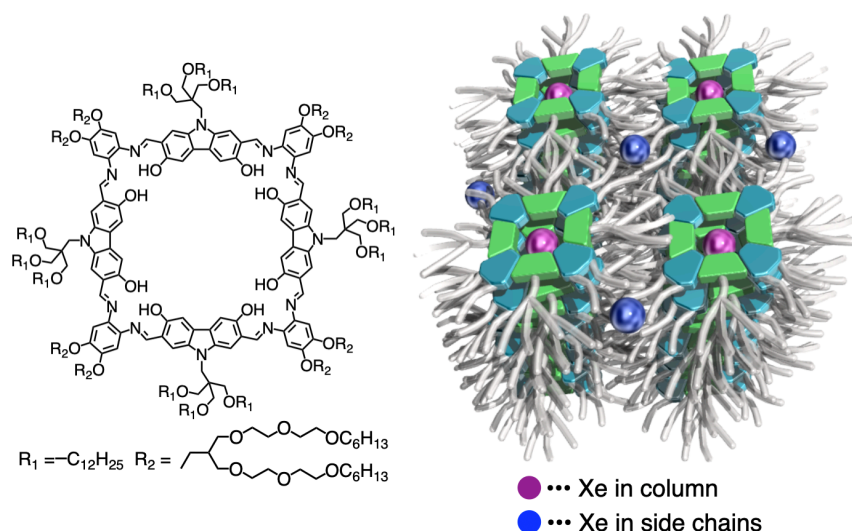


^{129}Xe NMR Structural Analysis of Continuous Porosity of Columnar Liquid Crystal Composed of Stacked Macrocycles

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Columnar assembly of macrocyclic molecules in liquid crystals are promising system for fluid nanoporous materials. Recently, we reported the columnar liquid-crystalline (LC) macrocycle composed of carbazoles and salphens that can accommodate tetraalkylammonium ions as the guest molecules inside the nanospace of the columnar liquid crystal through electrostatic interaction.¹ In this paper, we will discuss the first experimental analyses of void in the columnar liquid crystal of the macrocyclic mesogens by means of ^{129}Xe NMR spectroscopy. The chemical shift of ^{129}Xe in the nanospace inside the middle of the column are significantly affected by Xe pressure, temperature, and transitions of LC phases. Pulse-field gradient technique of ^{129}Xe NMR suggests that the xenon diffuses with a similar diffusion coefficient to those in the microspace of zeolites.² The substantial size of the nanospace is estimated to be 4.9 Å according to the ^{129}Xe NMR experimental results.



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