Dynamic Behavior of Dipolar Molecular Rotors in Their 2D Assembly Constructed Using a Tripodal Triptycene Supramolecular Scaffold

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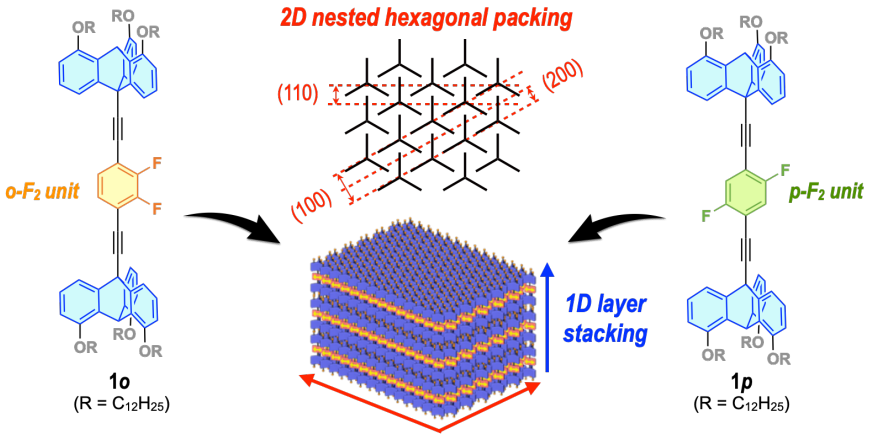
Controlling the free rotation of carbon-carbon bonds to create functionality has been a subject of interest. We have reported the synthesis of a two-dimensional (2D) assembly of dipolar *o*-difluorophenylene rotor (***o*-F₂**) units using a tripodal triptycene as a supramolecular scaffold.[1] These rotor units can exhibit rotational dynamics with low activation barriers of about 5 kcal/mol due to the free volume around them. We have also synthesized a derivative having a non-polar *p*-difluorophenylene (***p*-F₂**) unit and found that this molecule forms a 2D assembly similar to the case of ***o*-F₂**. In the present work, we have carried out various measurements, including solid-state ^{2}H and ^{19}F NMR, specific heat, and dielectric response to reveal the rotor dynamics in the 2D assemblies. We will discuss the dynamic behavior of the dipolar rotor units based on the results of these measurements and calculations.



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