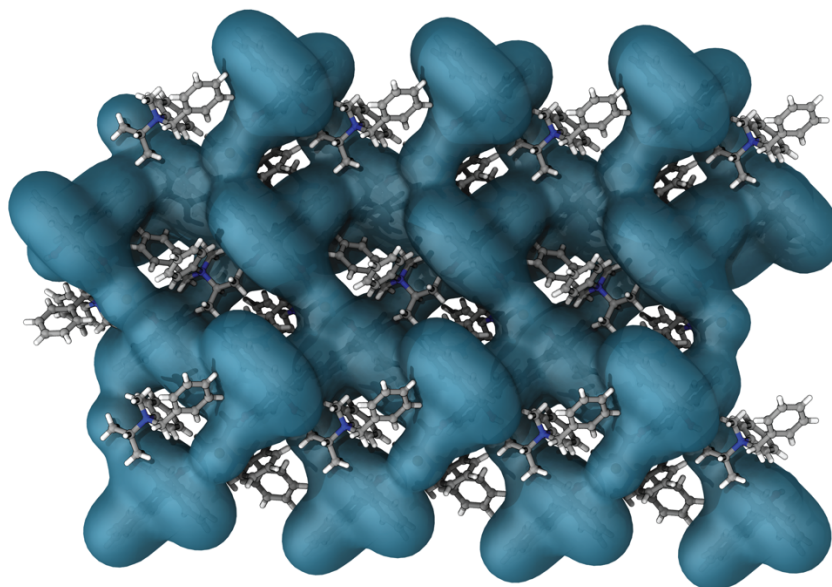
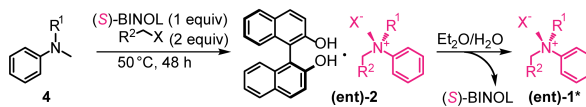


## Title: Enantioselective Synthesis of Chiral Ammonium Cations

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Control of molecular chirality is a fundamental challenge in organic synthesis. Whereas methods to construct carbon stereocentres enantioselectively are well established, routes to synthesize enriched heteroatomic stereocentres have garnered less attention. Of those atoms commonly present in organic molecules, nitrogen is the most difficult to control stereochemically. Although a limited number of resolution processes have been demonstrated, no general methodology exists to enantioselectively prepare a nitrogen stereocentre. This talk will discuss our recent observations that control of the chirality of ammonium cations can be easily achieved through a supramolecular recognition process. By combining enantioselective ammonium recognition mediated by 1,1'-bi-2-naphthol scaffolds with conditions that allow the nitrogen stereocentre to racemize, chiral ammonium cations can be produced in excellent yields and selectivities. Mechanistic investigations demonstrate that, through a combination of solution and solid-phase recognition, a thermodynamically driven adductive crystallization process is responsible for the observed selectivity. Distinct from processes based on dynamic and kinetic resolution, which are under kinetic control, this allows for increased selectivity over time by a self-corrective process. The importance of nitrogen stereocentres can be revealed through a stereoselective supramolecular recognition, which is not possible with naturally occurring pseudoenantiomeric *Cinchona* alkaloids. With practical access to the enantiomeric forms of ammonium cations, this previously ignored stereocentre is now available to be explored.