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**Separation of Ionic Solutes Using Nanoparticle-Crosslinked Polymer Hydrogels** PETER THOMAS, BANI CIPRIANO, SRINIVASA RAGHAVAN, University of Maryland — Polymer hydrogels are usually made by crosslinking a monomer such as N-isopropylacrylamide (NIPAAm) with a multifunctional crosslinker. Recently, gels have been shown to be formed even in the absence of monomer by using clay nanoparticles as crosslinkers. These particle-crosslinked gels tend to have larger pore sizes and higher gel strengths compared to conventional NIPAAm gels. In this talk, we will show that particle-crosslinked gels are also suited for use as separation matrices. In particular, we will describe the extraordinary ability of these gels to soak up a cationic solute from a solution. We speculate that cationic molecules can be adsorbed on the anionic surface of the clay platelets inside the gel, akin to a process of ion exchange. An additional unique property of these gels is that they can be disassembled in the presence of organic solvents – due to the non-covalent interaction between polymer and particles (there is no counterpart for this behavior in conventional covalently-linked gels). By exploiting this property, cationic solutes adsorbed on the particles within our gel can be released and recovered.

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