**Czech Chemical Society Lecture**

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# Photochemistry inside the cavities of coordination cages

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Nature has long impressed chemists with its ability to stabilize ephemeral chemical species, perform chemical reactions with unprecedented rates and selectivities, and synthesize complex organic molecules and exquisite inorganic structures seemingly effortlessly. What the natural systems consistently exploit is the aspect of confinement. In contrast, the use of confinement effects in a synthetic setup is relatively rare (examples include “on-water” catalysis and reaction acceleration within molecular containers). In this talk, I will discuss our recent studies on the synthesis of nanoporous molecules and materials capable of confining other, smaller molecules. I will focus on the cavities of supramolecular cages and discuss how we utilized them to tune the wavelength of azobenzene photoisomerization across the entire visible range. In this way, these cages act as light-driven supramolecular machines converting light energy into chemical energy in the form of out-of-equilibrium photostationary states that cannot be accessed directly using visible light.