

# Smart Materials: Methods and Applications – 2017 (SMMA-2017)

## IL01

### Topochemical azide-alkyne cycloaddition reactions in crystals and organogels

Kana M. Sureshan

*School of Chemistry, Indian Institute of Science Education and Research,  
Thiruvananthapuram, Thiruvananthapuram-16, India.*

Email: [kms@iisertvm.ac.in](mailto:kms@iisertvm.ac.in)

Topochemical reactions, reactions that occur in crystals and other organized media, are controlled by lattice arrangement of molecules.<sup>1</sup> These solvent-free and catalyst-free reactions are of great interest. There are only a handful of reactions that are amenable to topochemical reactions.<sup>2</sup> We have used azide-alkyne cycloaddition reaction for the topochemical synthesis of several biopolymer mimics.<sup>3-6</sup> Recently, we have achieved the synthesis of pseudopolypeptides by the Topochemical Azide-Alkyne Cycloaddition (TAAC) reaction of a dipeptide modified with azide and alkyne at its termini.<sup>7</sup> Gelation, by self-assembly of Low Molecular Weight Gelators (LMWGs), through noncovalent interactions, is another mode of molecular ordering and is closely related crystallization.<sup>8-</sup><sup>9</sup> Pursuing our interests in organogels we have developed a few gelators which can congeal oils and hydrocarbon solvents to give strong and self-supporting gels.<sup>10-12</sup> We have exploited the self-assembly and orderness in the microstructures of these gels to design gelators that can undergo topochemical reactions even in gel states.<sup>13-15</sup> A few novel examples of topochemical reactions in gels and crystals will be discussed.

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