2-(Hydroxyimino)aldehydes: More than oximes, better than aldehydes. The many talents of a new functional group

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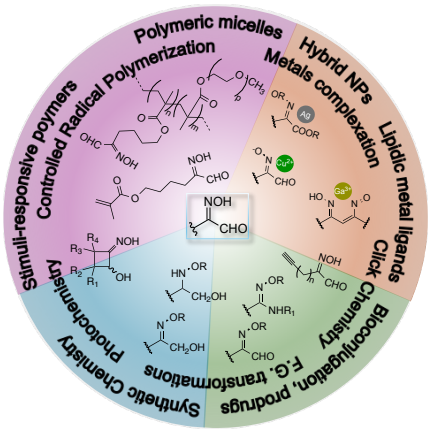

2-(hydroxyimino)aldehydes (HIAs) have been made accessible in the 2010s through a facile organocatalytic 2-oximation of aldehydes.[1] A wide range of HIAs has been obtained, including long-chain aliphatic molecules to be incorporated into lipid bilayers of liposomes, terminal alkynes for CuAAC click chemistry in bioconjugation, and a methacrylate for controlled radical polymerization.[2] The latter was co-polymerized with oligoethylene glycol methacrylates through CRP to yield random and block multi stimuli-responsive polymers.[3] The aldehyde group in HIAs undergoes highly chemoselective Norrish-Yang photocyclization, yielding cyclobutanoloximes (CBOs), whereas aldehydes usually undergo Norrish fragmentation type I or II.[4] The acidity of the oxime group is enhanced due to conjugation with the adjacent carbonyl group. HIAs can also be transformed into other functionalities, yielding 2-(hydroxyimino)alcohols, 2-(hydroxyimino)carboxylates, 2-(hydroxyamino)alcohols and their corresponding methyl or benzyl ethers. Investigated applications include prodrugs through generation of iminoxyl radicals; thermoresponsive polymeric micelles obtained through a pH gradient process, free of organic solvents;[3] micellar recyclable systems for the uptake and release of Cu(II) ions;[5] self-contained nanoreactors to obtain ultra-small AgNPs. Ga(III) complexes are being investigated in the context of synergistic strategies to combat multi-drug resistant infections.

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3. I. Antignano et al., *Langmuir*, **2022**, *38*(46), 14371.
4. A. Di Sabato et al., *Journal of Organic Chemistry,* **2022**, *87*(21), 13803.
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