DIPARTIMENTO DI SCIENZE CHIMICHE





Università degli Studi di Padova

Adapting Green Chemistry to Advance the Circular Economy

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Technological advancements are accelerating across disciplines, improving lives but also driving environmental pollution and related health issues. While halting progress is neither feasible nor desirable, scientists must prioritize developing effective mitigation strategies.

Recycling technological and plastic wastes is a critical first step toward efficient resource utilization and pollution prevention [1]. However, laboratory scientists have an earlier role to play: efficient resource utilization can be enhanced by promoting natural recycling processes or incorporating harmless chemicals into production and synthesis methods.

Similarly, analytical methods can be adapted to align with sustainable practices. Significant innovation is required to integrate plant molecules, natural polymers, and their derivatives into a wide range of analyses [2].



Figure 1. Polysaccarides used for sustainable practices: a) glycidyl methacrylate (GMA) grafting to cellulose nanocrystals (CNC) [3], b) α, β, γ cyclodextrins [4].

References

- [1] T. Yan, et al. Chem Sci 14 (2023) 5243–5265.
- [2] S.V. Mohan, R. Katakojwala, *Curr Opin Green Sustain Chem* 28 (2021) 100434.
- [3] K. Köse, et al. *Cellulose* 28 (2021) 471–487.
- [4] G. Crini, et al. *Environ Chem Lett* 16 (2018) 1361–1375.

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