Setting the Scene: the Principles and Practices of Green Chemistry

James H Clark

Green Chemistry Centre of Excellence, University of York (UK) and Fudan University (China)
james.clark@york.ac.uk

Green Chemistry is now a well established if not always well-practiced concept and driver for change in education, industry and research. Based on its founding *12 principles* it now needs to embrace the thinking of a modern circular economy and take a holistic view of the role of chemistry in a future more sustainable society. A new *circular chemistry* will support sustainability not only through the clean manufacturing processes and safe products emphasized in the original principles, but also through simpler processes and products, and through an increased degree of "design for recycling". The more complex is a product (formulation, plastic containing additives, etc.) the more difficult it will be to recycle. Reducing process complexity can go beyond using fewer derivatisations and employ fewer (as well as safer) auxiliaries while maximizing their recovery. Recycling for resource recovery must reach across all sectors and (circular) green chemistry needs to play an important role outside of the traditional chemical industries, seeking value in all waste streams including agri-food and municipal. We will need new metrics to support this and ensure they give credit for the valorization of wastes and recovered material inputs.

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