



# Green Chemistry: The metamorphosing technique

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## Abstract

In less than 15 years, "Green Chemistry" for "Sustainable development" has been the subject of extensive research worldwide. The definition of sustainable development is development that addresses current demands while maintaining the capacity of future generations to meet their own needs. Because sustainable development is concerned with evidence of pollution and the excessive use of natural resources, it is particularly significant for enterprises dependent on chemistry. For a long time, chemistry has been perceived as a dangerous subject, and most people identify the word "chemical" with being toxic and dangerous. In general, there are numerous ways to reduce risk by donning protective gear, however the risk of risks and exposure rises when safety precautions are not followed.

Keywords : *chemistry, green synthesis, catalyst*

"Green chemistry, a revolutionary approach to chemical design and production, prioritizes sustainability and environmental safety throughout the entire lifecycle of chemical products. By minimizing waste, reducing energy consumption, and utilizing renewable resources, green chemistry aims to mitigate the environmental impact traditionally associated with chemical processes. One key strategy of green chemistry involves the design of inherently safer chemicals, which are less toxic and harmful to both human health and the environment. Additionally, green chemistry promotes the use of alternative solvents and catalysts that are non-toxic and biodegradable. Through innovative techniques such as catalysis, biocatalysis, and material recycling, green chemistry offers practical solutions to pressing environmental challenges while fostering economic growth and technological innovation. Taking a look into use of this technique into nano synthesis, has led to an emerging approach towards applications in industries. Thus, metabolites extracted from plants are diverse chemical compounds produced through their metabolic processes. These bioactive molecules include alkaloids, flavonoids, terpenoids, phenolic acids, and glycosides, among others. Each metabolite possesses unique pharmacological properties and biological activities, making them valuable in various applications. They exhibit antioxidant, antimicrobial, anticancer, anti-inflammatory, and neuroprotective

effects, among others. Metabolites from plant extracts are extensively studied and utilized in pharmaceuticals, nutraceuticals, cosmetics, and agriculture. Their natural origin, biocompatibility, and therapeutic potential make them promising candidates for drug discovery and development, contributing to the advancement of medicine and sustainable agriculture while reducing reliance on synthetic chemicals. Overall, the adoption of green chemistry principles holds tremendous potential to revolutionize industries, ensuring a more sustainable and prosperous future for generations to come."

