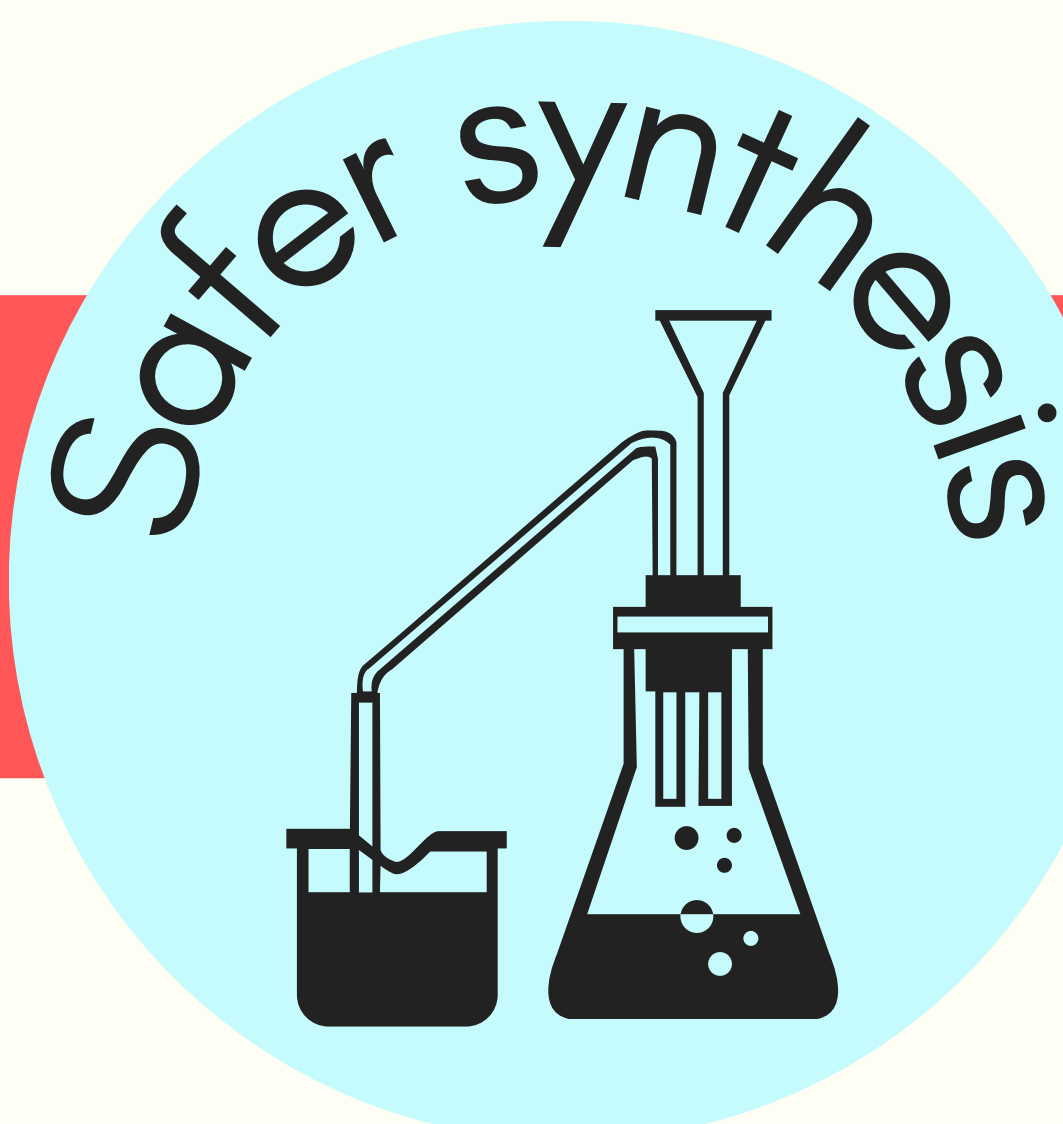


What is Green Chemistry?

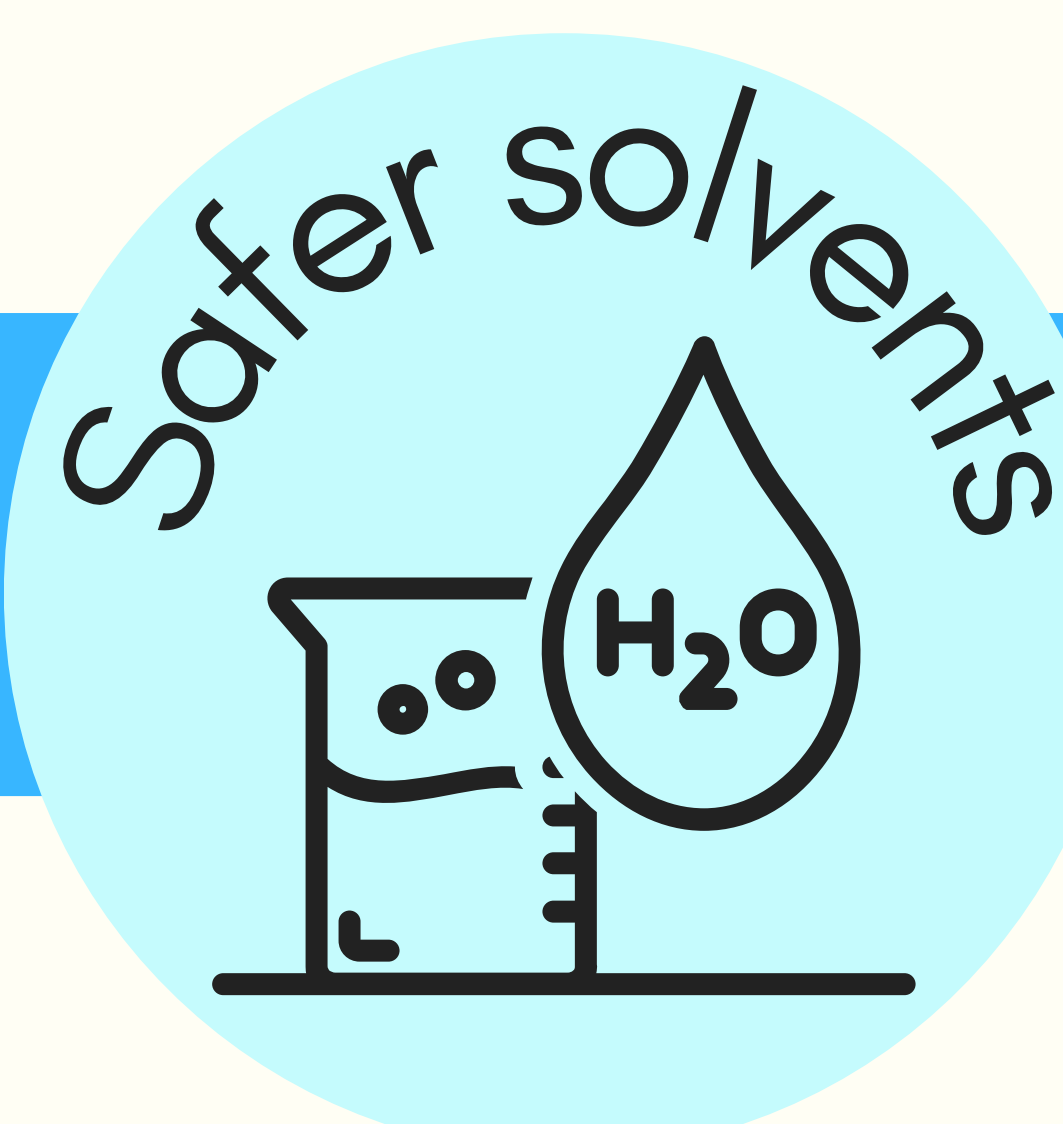
Green chemistry is designing products and processes in a way that is sustainable, environmentally friendly, economically viable and socially responsible. There are 12 guiding principles that are designed to protect and benefit people and the planet.



It is better to prevent waste than to treat and clean up waste after it is formed.



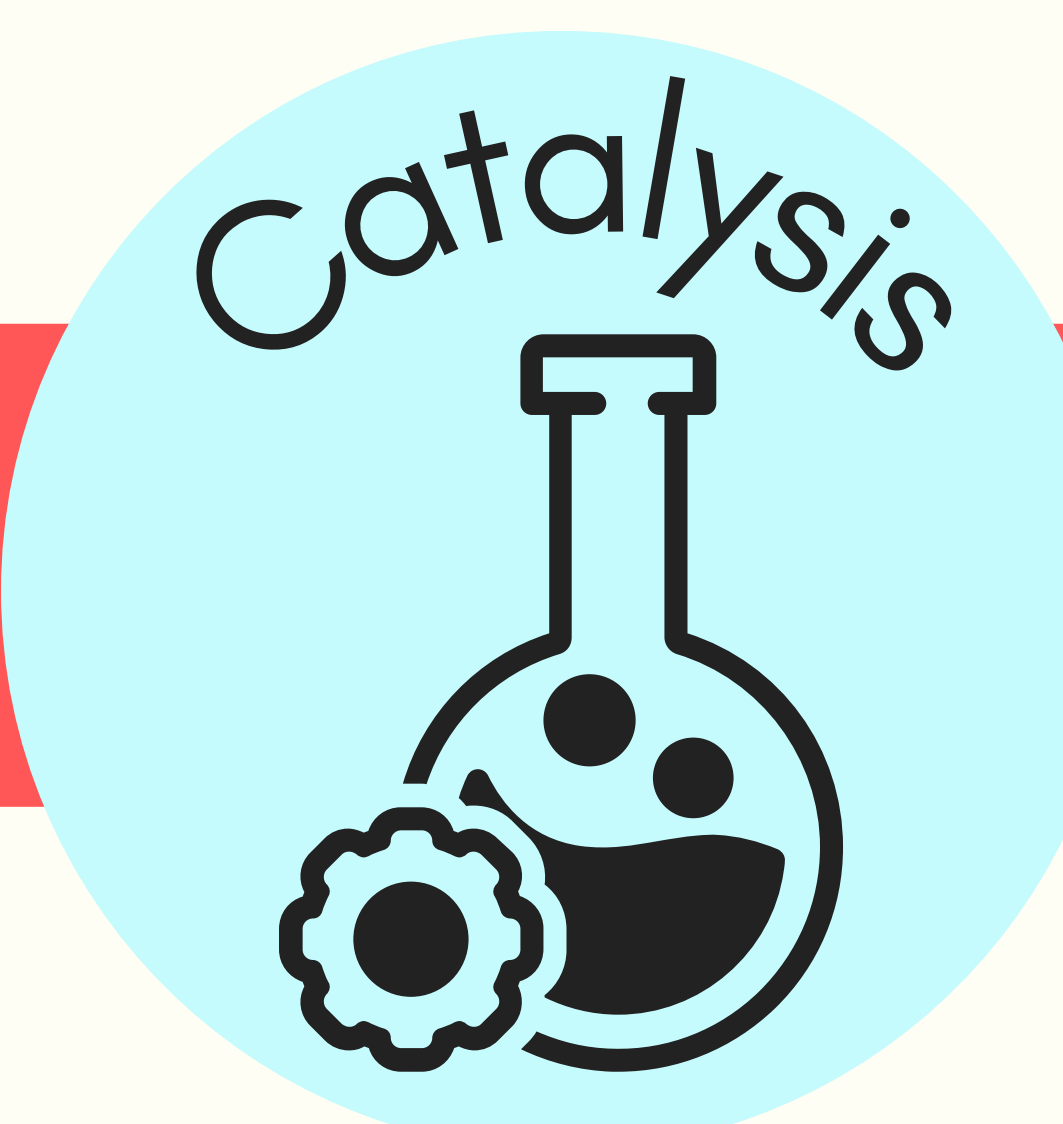
Whenever practicable, synthetic methodologies should be designed to use and generate substances that possess little or no toxicity to human health and the environment.



The use of auxiliary substances (solvents, separation agents, etc.) should be made unnecessary whenever possible and, when used, innocuous.



A raw material or feedstock should be renewable rather than depleting whenever technically and economically practical.

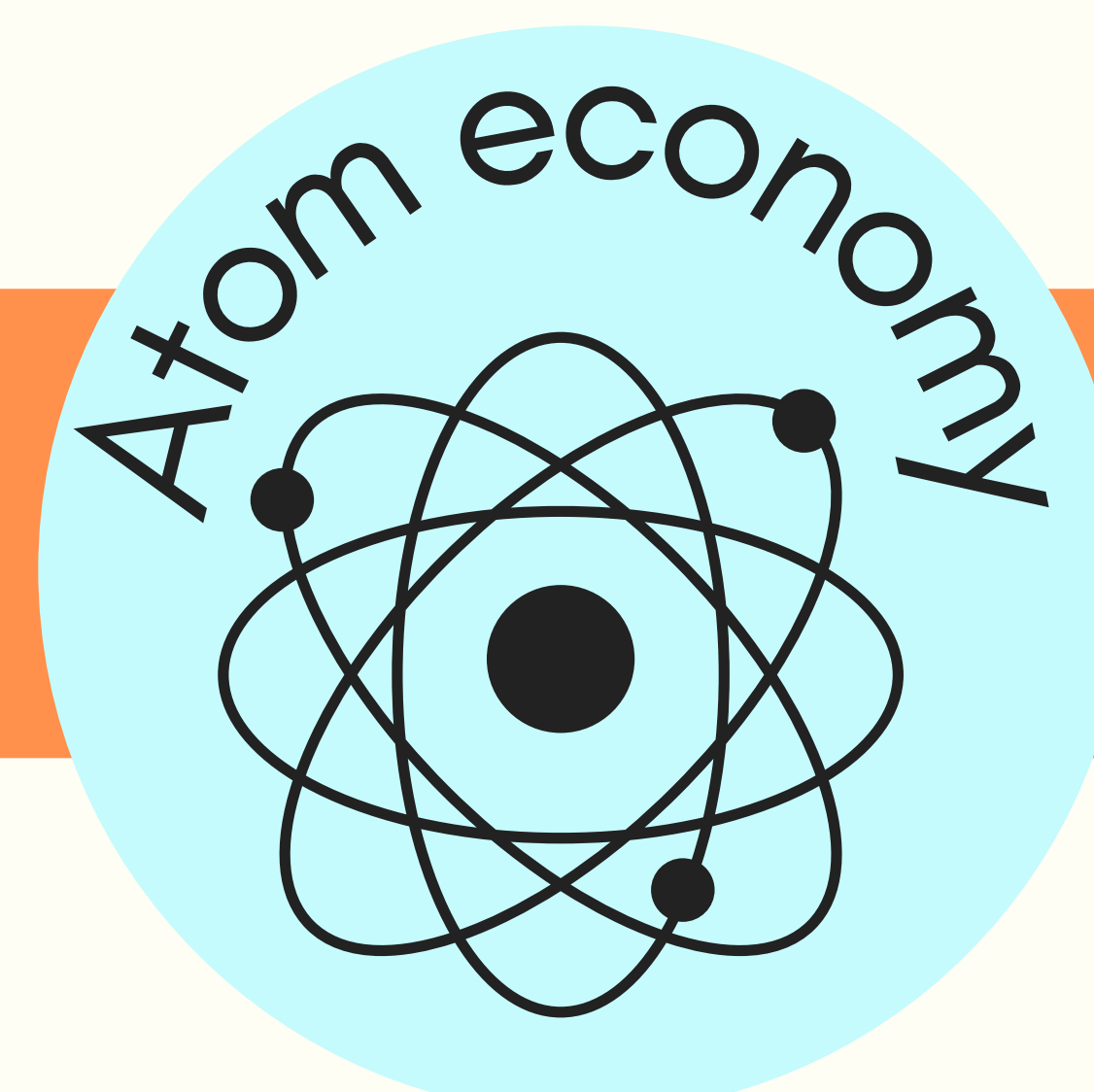


Catalytic reagents (as selective as possible) are superior to stoichiometric reagents.



Analytical methodologies need to be further developed to allow for real-time in-process monitoring and control prior to the formation of hazardous substances.

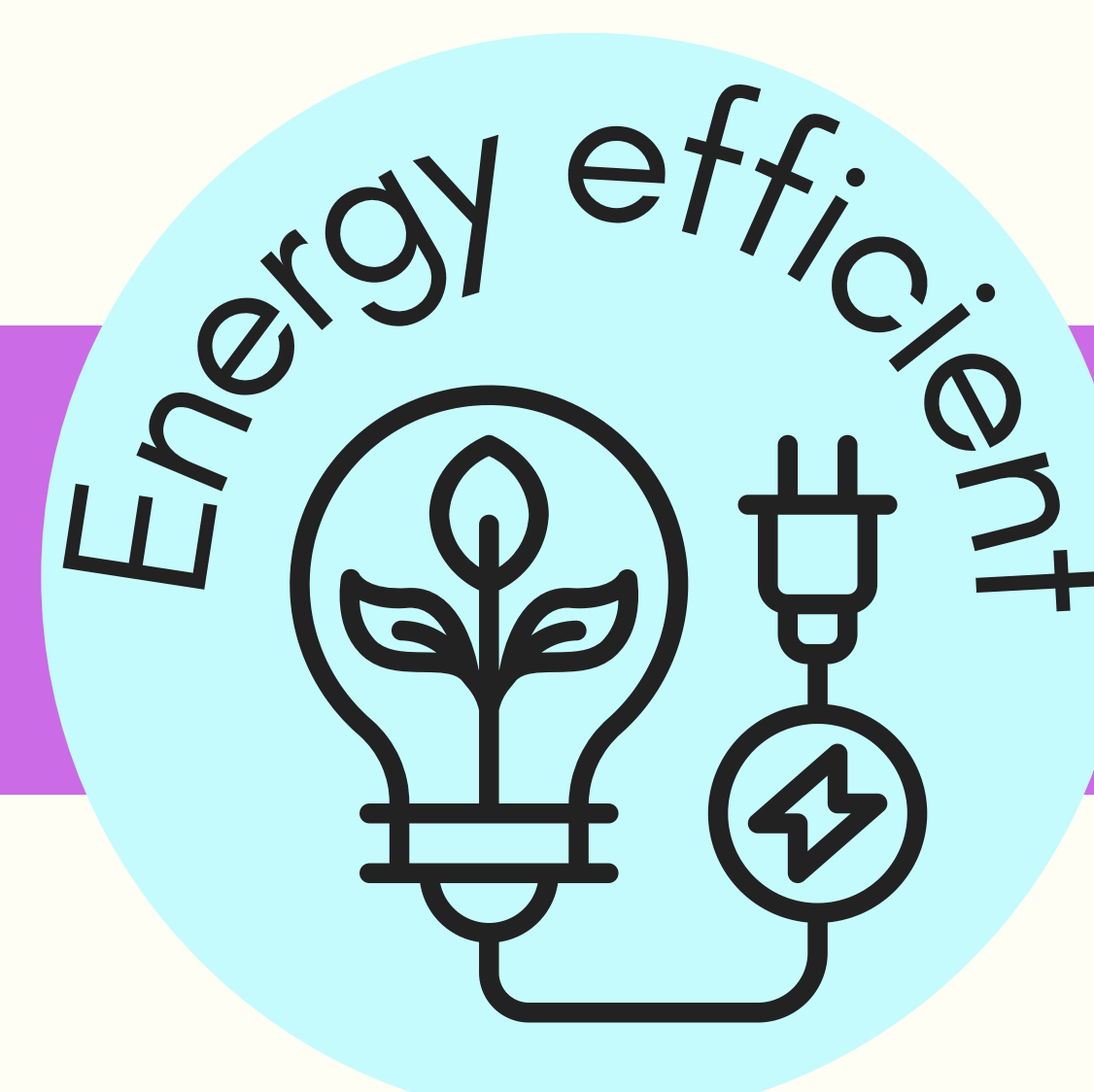
Substance and the form of a substance used in a chemical process should be chosen so as to minimize the potential for chemical accidents, including releases, explosions and fires.



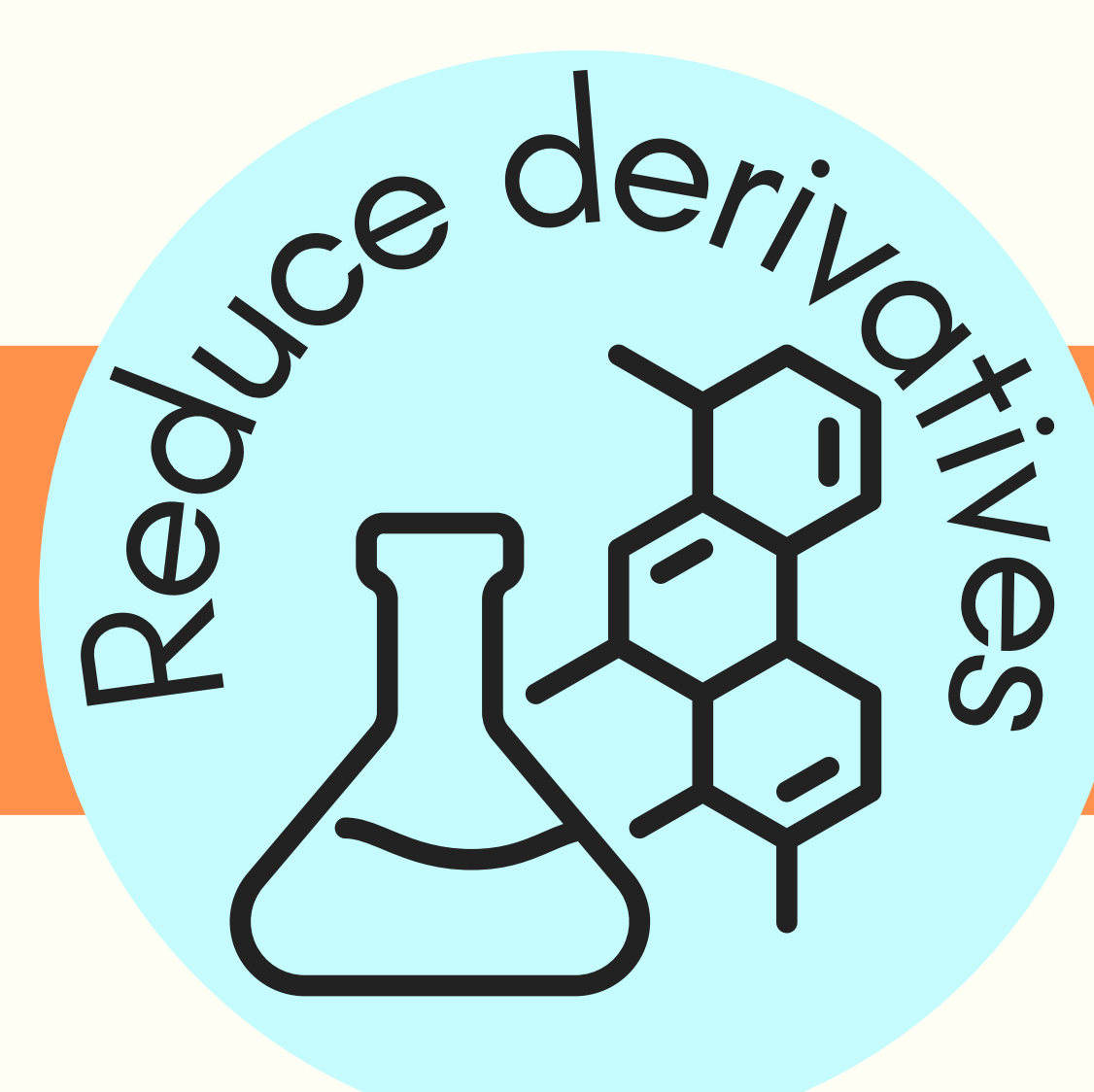
Synthetic methods should be designed to maximize the incorporation of all materials used in the process into the final product.



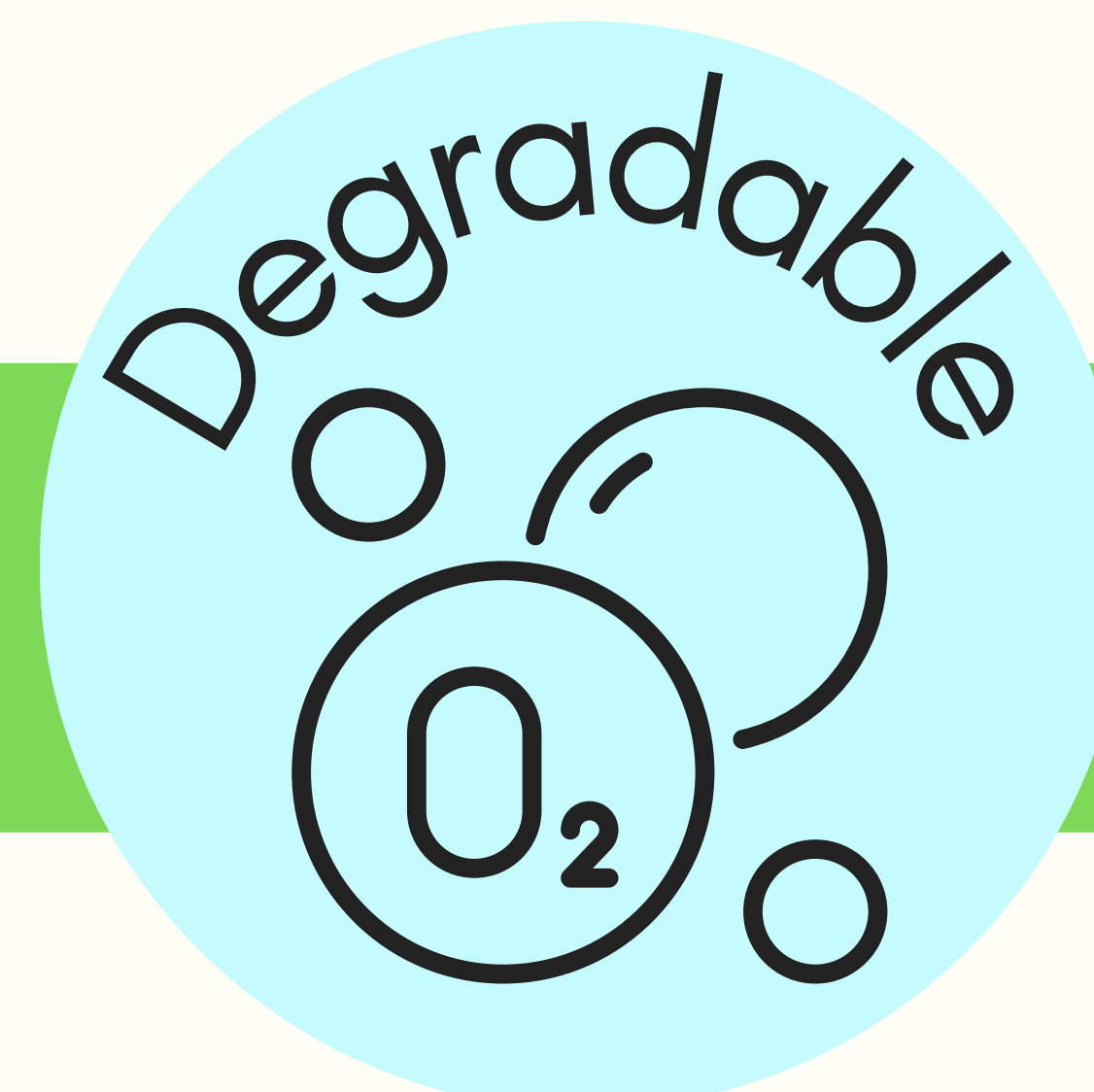
Chemical products should be designed to preserve efficacy of the function while reducing toxicity.



Energy requirements should be recognized for their environmental and economic impacts and minimized. Synthetic methods should be conducted to ambient temperature and pressure.



Unnecessary derivatization (blocking group, protection/deprotection, temporary modification of physical/chemical processes) should be avoided whenever possible.



Chemical products should be designed so that at the end of their function they do not persist in the environment and instead breakdown into innocuous degradation products.



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