

Green Chemistry

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- **What is Green Chemistry?**
- **Difference between Green and Ecological Chemistry**
- **Green Chemistry main principles**
- **Air pollution problem**
- **Green chemistry as a solution**
- **Conclusion**

Environmental Chemistry

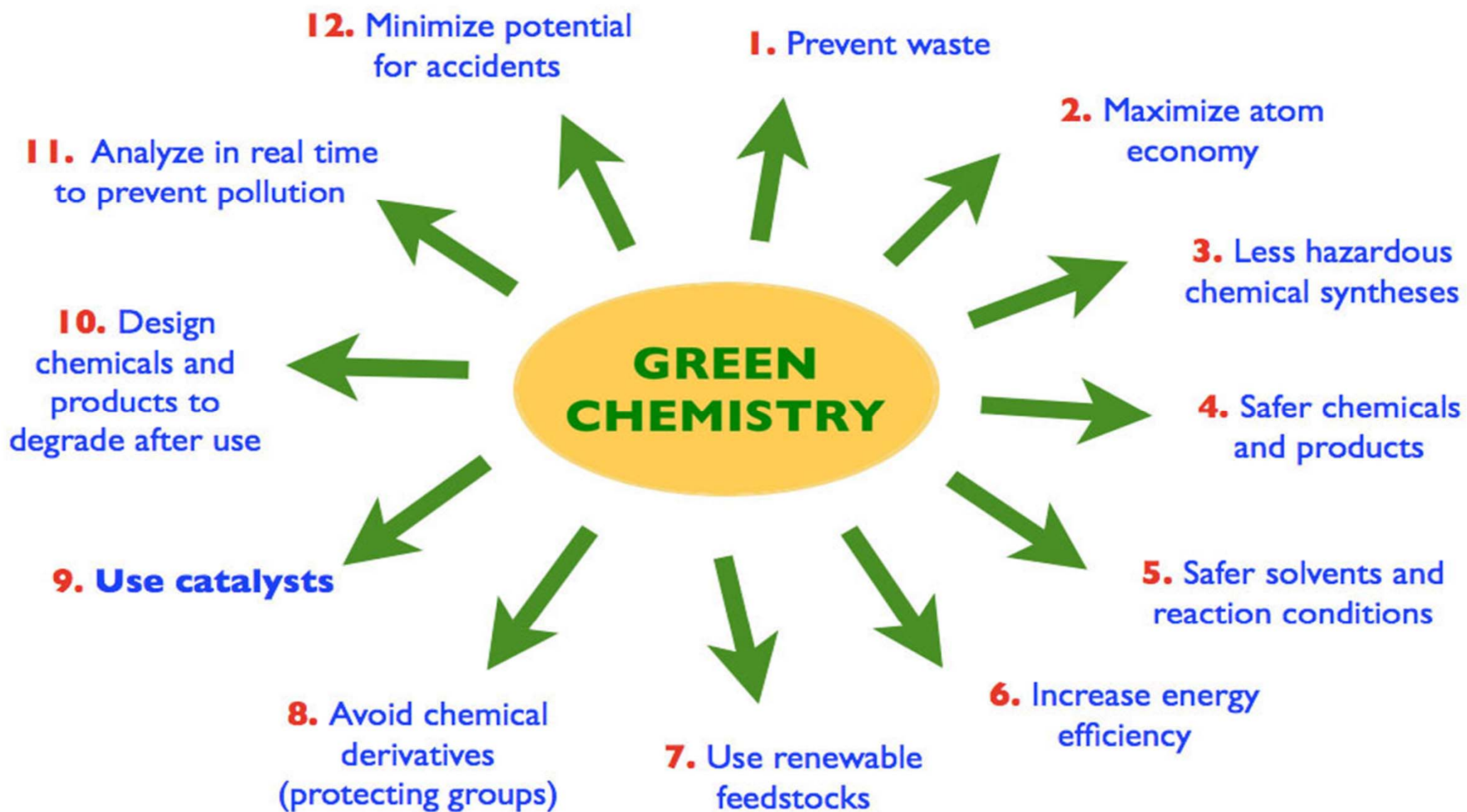
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graph TD; A[Environmental Chemistry] --> B[Cleaning up pollution (Remediation)]; A --> C[Reducing pollution at its source]; B --- D[Ecological Chemistry]; C --- E[Green Chemistry];
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**Cleaning up
pollution
(Remediation)**


Ecological Chemistry

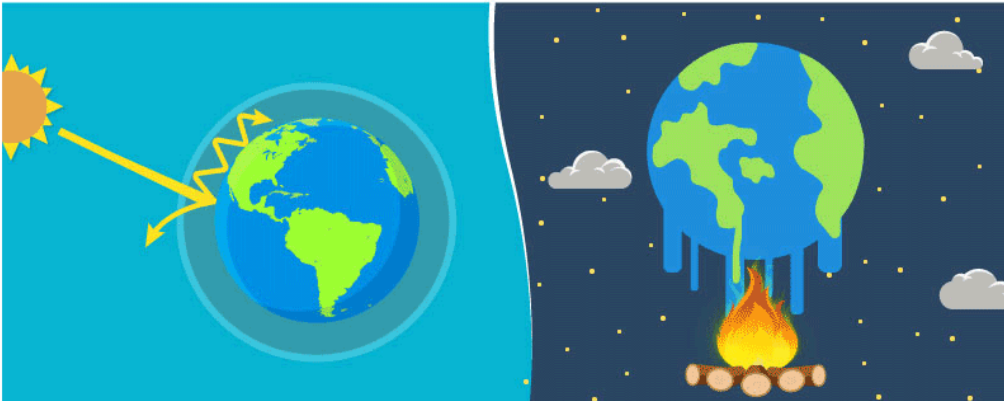
**Reducing
pollution at its
source**

Green Chemistry

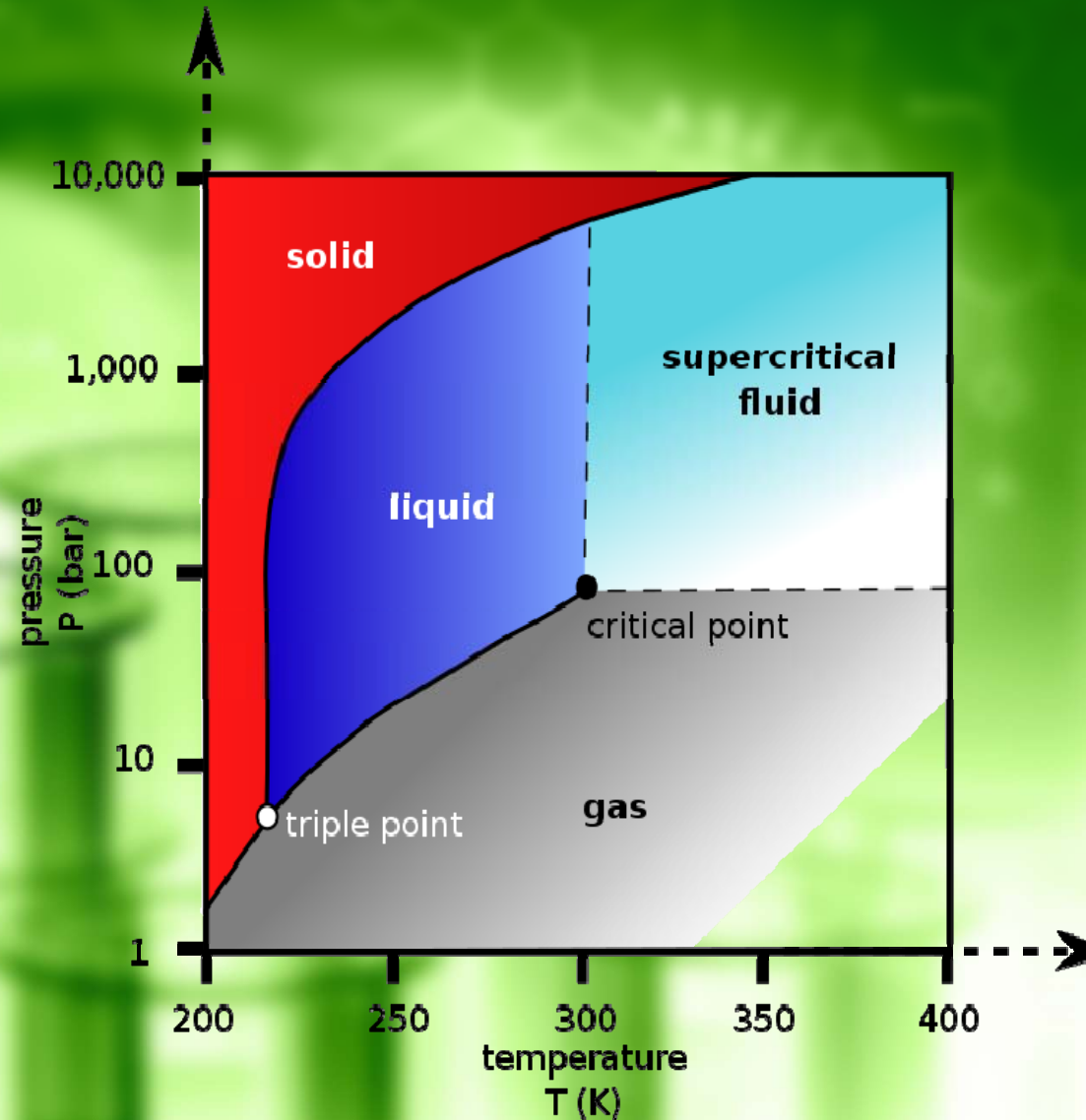




GREENHOUSE EFFECT **GLOBAL WARMING** 



A supercritical fluid is any substance at a temperature and pressure above its critical point, where distinct liquid and gas phases do not exist. It can effuse through solids like a gas, and dissolve materials like a liquid.



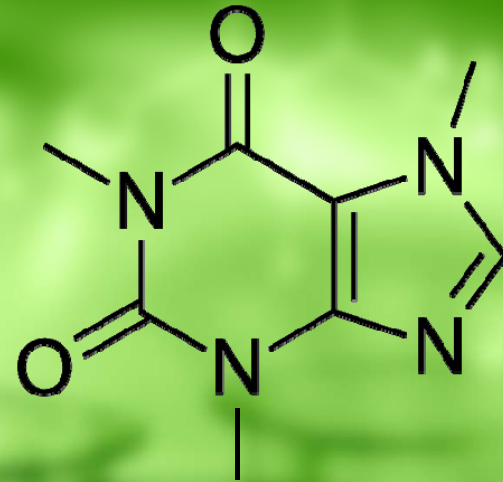
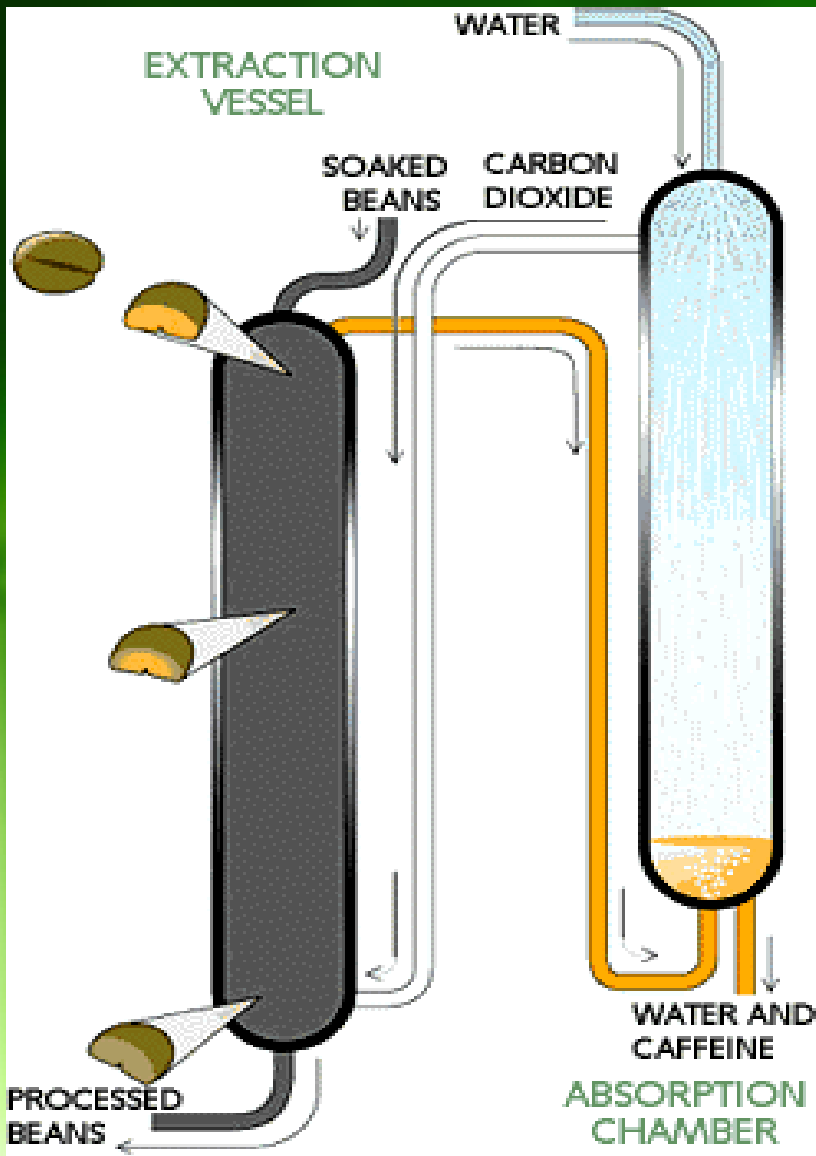


Green solvents

- Avoid or minimize solvents in first place
- Use less toxic solvents
- Use renewable solvents (not derived from petrochemicals)



Characteristics of an ideal Green Solvent	Liquid/supercritical CO_2
Nonflammable	Yes
Nontoxic	Yes
Non eco toxic	Yes
Abundant	Yes
Renewable	Yes
Easy to prepare	Yes
Easy to remove from a product	Yes
Does not contribute to smog	Yes
Does not contribute to global warming	CO_2 is recycled with minimal release



*Caffeine extraction from
coffee beans
with **supercritical CO₂***

- As blowing agent in polystyrene foam production - material used in packing and food transportation



- Organic synthesis



Catalysts:
Pt, Zn – acetate/Carbon

*Green Chemistry wants and leads to the world,
where green chemistry isn't needed anymore,
because everything will be already **GREEN***

Bibliography:

- <https://communities.acs.org/community/science/sustainability/green-chemistry-nexus-blog/blog/2016/06/10/why-is-co2-a-green-solvent>
- <https://pubs.rsc.org/en/content/articlehtml/2008/gc/b809498p>
- <http://advancinggreenchemistry.org/tag/co2/>
- <http://www.supercriticalfluids.com/wp-content/uploads/TN-105-Supercritical-Fluid-Technology-Green-Chemistry-for-the-21st-Century1.pdf>
- https://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display.highlight/abstract/358/report/F
- <https://repository.lib.ncsu.edu/handle/1840.16/5624>
- https://www.youtube.com/watch?v=qAqhq_ZBFUg
- <https://www.youtube.com/watch?v=RmaJVxafesU&t=4s>
- <https://www.youtube.com/watch?v=4PYxs8KBBHQ>



**THANK YOU FOR
ATTENTION!**