

School of Basic and Applied Science

Course Code : BSCC2101

Course Name: Green Chemistry

Green Chemistry

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Program Name: B.Sc

What is Green Chemistry?

Green chemistry can also be described as – Sustainable chemistry. – Chemistry that is benign by design. – Pollution prevention at the molecular level. – All of the above. Focus on processes and products that reduce or polluting substances

Any synthesis, whether performed in teaching, laboratories or industries should create none or minimum by-products which pollute the atmosphere

The Benefits of Green Chemistry

Economical

- Energy efficient
- Lowers cost of production and regulation
- Less wastes
- Fewer accidents
- Safer products
- Healthier workplaces and communities
- Protects human health and the environment

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WHY DO WE NEED GREEN CHEMISTRY?

Chemistry is undeniably a very prominent part of our daily lives.

- Chemical developments bring new environmental problems and harmful unexpected side effects, which result in the need for **'greener' chemical products.**

Eg. DDT.

- **Green chemistry looks at pollution prevention on the molecular scale**

It is an extremely important area of Chemistry due to the importance of Chemistry in our world today and the implications it can show on our environment. The Green Chemistry program supports the invention of more environmentally friendly chemical processes which reduce or even eliminate the generation of hazardous substances.

7.1 Green Chemistry

- ✿ Identification of environmentally preferable pathways requires creative advances in chemistry as well as process design.
- ✿ Because the number of choices in selecting reaction pathways is so large and implications of those choices are so complex, **systematic and quantitative design tools** for identifying green chemistries are not available.
- ✿ Nevertheless, an extensive body of knowledge concerning green chemistry exists and some qualitative and quantitative design tools are emerging.
- ✿ **Green Chemistry** : the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances.

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Chemical products can be manufactured a wide variety of synthesis routes. The chemical engineer who design a chemical process must choose

- Alternative raw materials
- Solvent
- Reaction pathways
- Reaction conditions

Design Choice

These design choices can have a significant impact on the overall environmental performance of a chemical process.

7.1 Green Chemistry

Ideal chemical reactions would have attributes such as

-  simplicity
-  safety
-  high yield and selectivity
-  energy efficiency
-  use of renewable and recyclable reagents and raw materials

In general, chemical reactions cannot achieve all of these goals simultaneously and it is the task of chemical engineers to identify pathways that optimize the balance of desired attributes

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