**WHAT IS GREEN CHEMISTRY ?**

**INTRODUCTION**

The concept of **Green Chemistry** introduced in the middle of 19th century, since then it has gained attention of all chemists. Convincing chemists to think in an environmentally friendly manner begins with education. However, while we enthusiastically teach and illustrate the twelve principles of green chemistry in theory but we do not follow them in our labs. In this course, we will try to use safer chemical methods (green methods) in lieu of the conventional methods and recommend some simple processes which could improve our laboratory functioning.

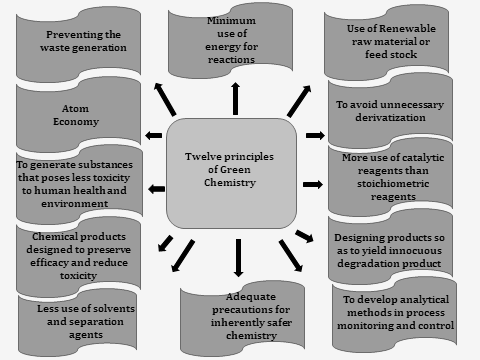
Green chemistry is defined as environmentally friendly chemistry, which aims to design new chemical methods/products that can reduce environmental pollution. Its objective is to target pollution at the design stage, even before it begins. Therefore, we plan this practical course to learn how to synthesize products and materials without using hazardous substances.

Ever since the twelve principles of green chemistry were introduced by Anastas and Warnerin 1998, a lot of work has been done for developing green synthetic procedures for various chemical reactions. Our quality of life has improved significantly through chemistry as it has provided us various useful products but this achievement has also resulted into a deprivation of global environment and decline in non-renewable natural resources. Many pollutants end up their way to the food chain and deteriorate the ecosystem. Pesticides and fertilizers residues from agriculture farms, flame retardants from electronics and oil from oil spillage/blast commonly affect the aquatic organisms, especially marine animals. Sustainability is at stake and the quality of life is under great threat.

Green chemistry and its principles can change all these negative impacts and through design, innovative and green practices to re-establish the earth’s sustainable development. The ultimate goal is to develop and design unconventional synthetic methodologies for important industrial chemicals in order to prevent/reduce environmental pollution.

Green chemistry approach plays a vital role in:

* Pollution prevention by improved operational practices by lowering energy consumption, improving yields.
* Development of greener processes to manufacture unchanged chemical products by avoiding the use of chlorinated compounds/ solvents if chlorine is not in the final product.
* Formulation of alternative chemicals for the same application.
* Avoidance of chemicals and also use of chemistry for improved environmental performance by designing chemical sensors for better observation of environmental quality.
* The twelve principles of green chemistry are shown in a figure below which helps to explain their significance.



**Figure: The twelve principles of green chemistry**