

Putting Green Chemistry into Practice - A Demand of Today

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In ancient time alchemists worked on experimental techniques to extend life expectancy and to convert base metals into gold. An alchemist was then popularly known as chemist. Later the suffix “ry” was added to describe art of the chemist and the word “chemistry” developed.

Chemistry is an important branch of science - A science of atoms and molecules and their interactions and transformations. Chemistry is a science that studies the composition, structure, property and change of matter that form our environment. Chemistry has various branches: physical chemistry, inorganic chemistry, organic chemistry, biochemistry, industrial chemistry, analytical chemistry and so on. With all these branches chemistry as a whole encircles variety of field’s viz., medicines, textile, agriculture, chemicals, food, engineering, photography etc. In hospitals and health centers medicines are being used to treat sickness. Medicines are nothing but chemicals synthesized by the chemists through knowledge of chemistry. Likewise chemicals used in sunscreen filter or block harmful ultraviolet rays to protect an individual from sunburn and/or skin cancer. Chemistry explains how food changes during cooking and how body uses it when the cooked food is engulfed. Chemistry, therefore, has wide application in different aspects of human life.

Considering this wide applicability researchers took interest in chemistry research and the product of chemistry research are now all around us. Chemistry research has significantly impacted on the health of nation in many ways. One example is the discovery of amlodipine as a drug for cardiovascular disease. Chemistry research has brought about significant changes in automobile industry. Plastics, rubbers, oils and lubricants, battery, coatings etc., used in cars are the products of chemistry research. In the field of agriculture chemistry research developed products like fertilizers, fungicides, insecticides which had significant impact on crop yields. Invention of antibiotics, hormones, vaccines through chemistry research uplifted veterinary medical care. In energy sector chemistry research provides solutions for development of sustainable biofuels and carbon dioxide reduction for a low-carbon future. Hydrogen when coupled with fuel cell technology serves as alternate fuel source for transport and power generation. In this way chemistry research offered significant results.

In spite of these significant results in chemistry research one cannot deny that in years past, and even at present, chemistry has been misused in many respects. Production of non biodegradable materials, release of pollutants and toxic substances caused harm to the environment and living things, including humans. Environment gets polluted, human health is being affected.

Emphasis is, therefore, given in chemistry research for the production of those chemicals which are eco friendly thus maximizing its benefits while reducing or eliminating its adverse effect to the environment. The practice came into force and a new wing of chemistry called “green chemistry” has been developed.

Green chemistry is sustainable chemistry. It is sustainable with respect to materials (by efficiently using the materials, maximum recycling and minimum use of virgin raw materials), waste (by reducing the production of waste) and economic (green chemistry normally costs less in strictly economic terms than chemistry as it is normally practiced).

Green chemistry runs on twelve principles like pollution prevention, reduction of synthesis of derivatives, use of renewable feedstocks, catalysis, safer solvents and auxiliaries, design for energy efficiency, designing safer chemicals, design for degradation, atom economy, less hazardous chemical synthesis, real-time analysis for pollution, prevention and inherently safer chemistry for accident prevention.

Working on these principles green chemistry can help to achieve sustainability and protect the environment without harming growth and development.

It is true that practicing green chemistry is not so easy, specially in large production plants as it requires a huge change in industrial set up. Awareness of green chemistry thereby intention to implement green chemistry is also not up to mark. But, putting green chemistry into practice is a demand of today.

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