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THE EDUCATIONAL AND RESEARCH VIEWPOINTS OF THE GREEN CHEMISTRY

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ABSTRACT

Green chemistry revolution is an interdisciplinary subject, which sets out to reduce the materials and energy consumption of chemical processes and products, minimise or eliminate the dispersion of harmful chemicals in environment, maximise the use of renewable resources and extend the durability and recyclability of products.

Key words : Green Chemistry, Waste Minimisation, Recyclability

INTRODUCTION

Using alternative feedstocks of more selective chemistry and designing less toxic and inherently safer chemicals in a way which increases industrial competitiveness. Hence, in chemical synthesis, the ideal will be a combination of a number of environmental, health, safety and economic targets.[1-3]

It has been observed that there is a general lack of awareness and training in schools, universities, industries and managements; That: "***Green Chemistry*** is a cost without benefits", therefore, there is a perception of a need for revolutionary change in teaching and research to introduce "***Green Chemistry***".

This communication summarises how teaching and research programmes can evolutionary approach to the areas of green chemistry and incorporate into every related course from high school onwards.

The important goals in academic and industrial research are to create new pathways to produce more useful products with less waste or preferably no waste. To examine research proposals, the students would use a known reaction first, then do one which has not been done before.[3] To write investigative reporting, the students should check, how green their processes are ? The reports should identify, what chemicals are being used and make proposals for reducing the use of energy and toxic chemicals.

The following accounts are the viewpoints to the educational and research aspects of the green chemistry[4] :

(i) To study the possibility of changing the course of a reaction to reach a new and useful selectivities.

(ii) To investigate the improvements of selectivities, e. g. yields, waste minimization,[5,6] rates, energy savings, etc.

(iii) The study of using non-classical reagents or reagents obtained under unusual conditions, e. g. the possibility of running solvent-free synthesis[7,8], using water as a solvent in organic reaction[9,10] , running reactions in supercritical carbon dioxide[11-15], performing biomass[16] and biotechnology[17], and utilizing ultrasound[4] or microwaves[18] and using heterogeneous catalyst[4], etc. during the course of a reaction. New chemistry improves the economics of chemical manufacturing and enhances the position of chemistry.

The more successful researchers and educationalists will be those that can appreciate the value of green chemistry in innovation, application and teaching. The conclusions obtained from reaserch proposals of green chemistry would be beneficial to design and redesign the chemical syntheses and chemical products to prevent pollution. It also improves the perception of educational goals to find a new way of looking at chemicals and their manufacturing processes to minimize any negative environmental impacts. This approach provides a fundamental methodology for changing the intrinsic nature of chemical research and education.

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