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EDITORIAL

Green Chemistry

In the last twenty years environmental protection aspects have become more and more important in chemical production. The international chemistry community is under increasing pressure to find 'green' alternatives to current processes and to make increased efforts in the development of 'green' processes for new products. The definition of Green Chemistry can be stated as follows:
Green Chemistry is the utilisation of a set of principles that reduces or eliminates the use or generation of hazardous substances in the design, manufacture and application of chemical products.

Chemists, chemical engineers and process engineers from a wide variety of backgrounds have reached a consensus on the importance and timeliness of this 'green' thinking. The supportive evidence for this is underlined by the emphasis placed on relevant research by national and transnational funding agencies and greater involvement by governments in controlling the use of resources and the production and disposal of waste.

In addition the public tend to be more aware of the hazardous substances that many chemical processes use and generate than the benefits of the products themselves. Chemistry and the chemical industry still have tarnished images. With the efforts in the responsible care programs in the past years, it has been possible to improve public perception of chemical production. We have to continue with the initiatives to sell our 'green' results and improvement in chemical production.

Some examples of the above-mentioned principles for Green Chemistry include:
- Motivation of employees for 'green' thinking
- Clean synthesis (*e.g.* new routes to important chemical intermediates, including heterocycles)
- Enhanced atom utilisation (*e.g.* more efficient methods for chlorination, bromination)
- The replacement of stoichiometric reagents (*e.g.* catalytic oxidations with air as the only consumable source of oxygen)
- Enantioselective microbial processes
- Processes with reduced energy consumption or energy recovery
- New solvents and reaction media (*e.g.* use of supercritical fluids and reactions in ionic liquids)
- Water-based processes and products (*e.g.* organic reactions in high-temperature water)
- Reduction of the solvent loads in wastewater
- Replacements for hazardous reagents (*e.g.* the use of solid acids as replacements for traditional corrosive acids)
- Alternative feedstocks (*e.g.* the use of plant-derived products as raw materials for the chemical industry)
- New safer chemicals and materials (*e.g.* new natural-product-derived pesticides)
- Waste minimisation and reduction (*e.g.* applying the principles of atom utilisation and the use of selective catalysts).

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The reports in this issue of CHIMIA cover some of the above topics and are intended as a demonstration of the continued awareness in industry concerning the principles of Green Chemistry. The emergence of these principles, which can be used in the conception and execution of synthetic chemistry, chemical production and in the usage of the chemicals produced, show that there is an ongoing evolution of Green Chemistry.

When it comes to publishing such work, conflict often arises because good examples may be connected with company know-how and so there is reluctance with respect to publication. Therefore the presented works offer a first selection. In the future it would be desirable to publish further results and the NSCS Section for Industrial Chemistry is willing to pursue corresponding proposals for Green Chemistry.

H. Dettwiler

The Editorial Board of CHIMIA warmly thanks the coordinating guest editor Dr. Hans-Rudolf Dettwiler, president of the Section of Industrial Chemistry (SCI) of the New Swiss Chemical Society (NSCS) for his enormous commitment in bringing together the present contributions concerning a wide variety of Green Chemistry principles in industry.