

Environmental Outlook



Understanding Green Chemistry

In this article we will review Green Chemistry as a part of the Pollution Prevention movement and look at the roles of NSF International, Green Seal and REACH in Green Chemistry.

Pollution Prevention – The Basis for Green Chemistry

In the 1970's, the acute and visible pollution problems of our air and water and the growing problems of hazardous waste disposal pointed us as a nation toward controlling and managing the wastes that we could see. EPA developed standards, promulgated regulations and enforced the law with an emphasis on end-of-pipe solutions. These actions had a measurable and positive effect on environmental quality.

In the 1980's, as better methods of detection increased our understanding of how ubiquitous and long-lived our waste problems are, we became more keenly aware of more diffuse and less obvious sources of pollution. This growing awareness of the difficult-to-control sources of pollution and the recognition of the global nature of environmental issues brought the concept of pollution prevention to the fore as a compelling response to the pollution problem. This change in focus from an end-of-pipe treatment approach to pollution prevention was a basic reorientation of the nation's approach to pollution that would prevent problems before they occurred rather than simply trying to deal with them after they had been created.

The growing awareness of the need for pollution prevention ultimately resulted in the passage of the Pollution Prevention Act of 1990. This law requires that "pollution be prevented or reduced at the source whenever feasible; pollution that cannot be prevented should be recycled in an environmentally safe manner, whenever feasible; pollution that cannot be prevented or recycled should be treated in an environmentally safe manner whenever feasible; and disposal or other release into the environment should be employed only as a last resort and should be conducted in an environmentally safe manner."

In summary, pollution prevention focuses on reducing or eliminating waste at the source by modifying production processes, promoting the use of non-toxic or less-toxic substances, implementing conservation techniques, and re-using materials rather than putting them into the waste stream.

What is the US EPA doing to promote Green Chemistry?

The EPA's Office of Pollution Prevention and Toxics administers the Pollution Prevention program which includes a number of green initiatives. Two of these are particularly important to this discussion: Green Chemistry, and Design for the Environment.

Green Chemistry - In its Green Chemistry Program, originally known as the Alternative Synthetic Pathways for Pollution Prevention, EPA defines Green Chemistry as follows:

Green chemistry, also known as sustainable chemistry, refers to environmentally friendly chemicals and processes that result in: reduced waste, eliminating costly end-of-the-pipe treatments; safer products; and the reduced use of energy and resources—all improving the competitiveness of chemical manufacturers and their customers.

The mission of the EPA's Green Chemistry program is to promote innovative chemical technologies that reduce or eliminate the use or generation of hazardous substances in the design, manufacture, and use of chemical products.



Design for the Environment (DfE) - This program forms partnerships between the EPA and stakeholder industries to help develop safer chemistries to reduce risk to people and the environment by preventing pollution. The DfE program partnership that directly relates to specialty chemical formulations like those we manufacture is the **Chemical Formulator program**. Formulators who participate in this program have DfE review each ingredient in a product to ensure that the ingredient is among the safest in its class and DfE will work with formulators to help them choose safer ingredients to use in their products. Products that meet the requirements outlined in DfE's Review Guidelines are recognized by DfE and may display the DfE logo. These products are also listed on EPA's website. Out of this partnership has come the DfE **CleanGredients™** subscription data base of safer cleaning product ingredients that formulators can use to identify safer raw materials.

Green Chemistry then, has two distinct definitions: In the Green Chemistry program it refers broadly to those manufacturing technologies that reduce or eliminate the use or generation of hazardous substances while in the DfE Chemical Formulator program it refers to those formulated end use products that pose a reduced risk to human health and the environment.

What role does NSF International play in Green Chemistry?



NSF International, a not-for-profit, non-governmental organization with programs in standards development, product certification, education, and risk-management for public health and safety, has been selected by the EPA to prepare product ingredient profiles for partnership candidates under the DfE Formulator Program. NSF reviews cleaning product formulations for their environmental and human health profiles using criteria developed by DfE under the the **CleanGredients™** Program. Once successfully reviewed, formulators are recognized by DfE and are then allowed to use the DfE logo on their products.

What role does Green Seal play in Green Chemistry?



Green Seal, founded in 1989, is a nonprofit organization which develops environmental certification standards and fee based certification for various products including hand cleaners, hard surface cleaners and floor care products. Companies whose products meet the Green Seal Certification standards may display the Green Seal on their certified products.

What is REACH and how will it impact Green Chemistry?

Passed into law on June 1, 2006, REACH is a new European Community Regulation on chemicals and their safe use. It deals with the **R**egistration, **E**valuation, **A**uthorization and **R**estriction of **C**hemical substances. The aim of REACH is to improve the protection of human health and the environment through the better and earlier identification of the intrinsic properties of chemical substances.

The REACH Regulation gives greater responsibility to industry to manage the risks from chemicals and to provide safety information on the substances. Manufacturers and importers will be required to gather information on the properties of their chemical substances, which will allow their safe handling, and to register the information in a central database run by the European Chemicals Agency (ECHA) in Helsinki.

The Regulation also calls for the progressive substitution of the most dangerous chemicals when suitable alternatives have been identified.

As world markets become increasingly interconnected, the regulatory requirements and direction of REACH will affect us all. The registration requirements of REACH are expected to result in the disappearance of many chemicals from the market as smaller manufacturers may be unable or unwilling to bear the expense of developing the required data. Additionally, the REACH requirement to replace more hazardous

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products with less hazardous materials will provide added impetus to the more rapid development of Green Chemistries.

Shepard Bros and Green Chemistry

Shepard Bros. has a proud heritage as a leader in Green Chemistry. Whether in our manufacturing processes designed to maximize yield and minimize waste, or in our technologically advanced green products that permit superior application results at reduced usage rates, we are firmly committed to the Pollution Prevention movement and to the development of Green Chemistry solutions to help our customers meet their environmental, social and financial goals.

To learn more about Green Chemistry at Shepard Bros. visit our website at: www.Shepardbros.com and click on the Green Chemistry link.

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