



## California Green Chemistry Initiative

### Questions & Answers

**Q. What is green chemistry?**

- A.** Green chemistry is an innovative way to reduce or eliminate the use of hazardous and toxic chemicals. Green chemistry is a fundamentally new approach to environmental protection, transitioning away from managing materials containing toxic chemicals at the end of a product's life cycle, to reducing or eliminating the use of toxic chemicals altogether. Green chemistry encourages cleaner and less-polluting industrial processes and products, and ensures that manufacturers take greater responsibility for the products they produce.

When implementing green chemistry, those designing consumer products and determining manufacturing processes consider the public health and environmental effects of those products. Green chemistry practitioners design new processes and reformulate products to reduce or eliminate the use or releases of hazardous chemicals in several phases: 1) when companies manufacture the products; 2) when consumers use the products; and 3) when the products (and their packaging) are disposed.

For example, Columbia Forest Products has converted all of its standard hardwood plywood production to produce formaldehyde-free panels called PureBond™. As a result, the company's switch avoids the need to address formaldehyde pollution, and reduces the adverse health effects from formaldehyde on workers and communities ([www.cfpwood.com](http://www.cfpwood.com)).

**Q. Why do we need green chemistry?**

- A.** Consumers do not have complete information about chemicals in the products they use or about the possible negative effects of those chemicals. With thousands of chemicals used in commerce today, a comprehensive approach is needed to reduce and eliminate the use of chemicals of concern. Green chemistry is long-term environmental protection. It promotes public health and helps protect our environment for generations to come.

For example, the California Department of Toxic Substances Control (DTSC) has tested a variety of consumer products at its Berkeley environmental chemistry laboratory. A child's necklace, labeled "nickel and lead free," was found to have nearly one percent (by weight) lead—which exceeds hazardous waste criteria. A child's lunchbox was analyzed and found to contain high levels of lead and cadmium—another toxic metal.

Recent news reports have cited the concern over Bisphenol-A, an ingredient in plastic products, and melamine-based coatings in food cans. Each of these chemicals may migrate to the food and then be consumed.

These are just a few examples of ordinary consumer products that contain toxic materials—either as an intended ingredient or “along for the ride.”

**Q. What is the California Green Chemistry Initiative?**

- A.** The California Green Chemistry Initiative is a collaborative approach for identifying options to significantly reduce the impacts of toxic chemicals on public health and the environment. The initiative will provide recommendations for developing a consistent means for evaluating risk, reducing exposure, encouraging less-toxic industrial processes and identifying safer alternatives.

The initiative will be accomplished through a transparent process, with stakeholder involvement. Communication will be facilitated through workshops, symposia and conferences, stakeholder meetings, Web site communications, in addition to consultation with universities, environmental, industry and public interest groups, U.S. Environmental Protection Agency, and other government agencies.

Most importantly, the California Green Chemistry Initiative will ensure a comprehensive and collaborative approach, to increase accountability and effectiveness of environmental programs across state government.

**Q. Why does California need a comprehensive approach to toxic chemicals?**

- A.** A recent study by the University of California at Berkeley concluded that we know little about many of the chemicals used in commerce. The California Environmental Protection Agency (Cal/EPA) is initiating the California Green Chemistry Initiative to take a comprehensive look at a chemicals policy for California. In recent years, a handful of bills each year have been signed into law, each addressing a small piece of chemical policy (i.e., bans on certain flame retardants (PDBE), cosmetics regulations, lead in candy, and lead in pipes). Cal/EPA and its boards, departments, and office have also been dealing with chemical policy decisions one by one by way of regulations, ordinances and studies. Some cities, such as San Francisco, are taking on chemical policy decisions at the local level. This chemical-by-chemical and product-by-product approach is leading to a patchwork quilt of chemical regulation. A comprehensive and unified approach is needed to ensure accountability and effectiveness.

**Q. What are the economic benefits of green chemistry?**

- A.** Green chemistry, at its very core, is about designing products and processes to reduce or eliminate the use of toxic chemicals. The California Green Chemistry Initiative will promote better coordination of laws intended to manage chemicals, creating a comprehensive system to ensure accountability and effectiveness. Many companies that are already using green chemistry principles are recognizing significant economic benefits. These include

less hazardous waste generation and resulting financial liability, less water and air pollution, and ultimately less public health costs. There is also the growing market trend toward green business that is a strong economic motivator.

For example, Avalon Organics in Petaluma reformulated its products to eliminate chemicals banned in Europe, avoid other chemicals of concern, and eliminate petroleum-based ingredients. Annual data for the period ending February 2006 shows that Avalon outpaced the market-average growth rates for a range of products and enjoys healthy profits ([www.cleanproduction.org/library/CPA-HealthyBusiness-1.pdf](http://www.cleanproduction.org/library/CPA-HealthyBusiness-1.pdf)).

Interface Fabric reportedly saved \$300,000 annually with new interior fabrics developed from a corn-based biopolymer. A new protocol was established to screen out dyes and other substances typically used that are persistent, bioaccumulative and toxic. As a result, the biopolymer based fabrics exhibit superior performance in terms of stain resistance, flame retardancy, and odor control. The substitution also resulted in reductions of water and fuel used, and greenhouse gas emissions ([www.interfacefabric.com](http://www.interfacefabric.com)).

SC Johnson Company, since 2001, has reportedly eliminated more than 24 million pounds of hazardous chemicals and removed more than 10 million pounds of volatile organic compounds from its environmental footprint, and continues to remove an additional 2.6 million pounds each year ([www.scjohnson.com](http://www.scjohnson.com)).

As one more example of how implementing green chemistry principles are economically beneficial, California companies reduced the generation of more than 64,000 tons of hazardous waste by 2002 and eliminated the cost for managing those wastes. Source reduction strategies reduced their hazardous waste generation by 11 percent as reported in DTSC's SB 14 reports

([www.dtsc.ca.gov/PollutionPrevention/SB14/SB14SourceReduction.cfm](http://www.dtsc.ca.gov/PollutionPrevention/SB14/SB14SourceReduction.cfm)).

Workers and community members were protected from adverse effects of exposures to those hazardous substances. Eliminating these quantities of hazardous waste has saved California businesses millions of dollars.

**Q. How does “green chemistry” differ from traditional efforts to reduce pollution?**

**A.** The 20th century approach to environmental protection focused on controlling air emissions, discharges of contaminants to surface and groundwater, and the management of solid and hazardous wastes. While “pollution prevention” programs traditionally focus on reducing pollutants at the source, green chemistry involves the design phases such as product formulation.

The California Green Chemistry Initiative will explore such issues as:

- The toxicity of chemicals used in products, processes and commerce
- The physical and chemical properties of chemicals, including their potential to leach or migrate from products
- The fate and transport of chemicals in the environment, and the health and environmental risks
- The economic and technical considerations of alternatives
- Identifying areas where investment in research and development is needed

- Identifying innovative technologies or alternatives
- Where chemical use restrictions may be warranted

**Q. What is the goal of the California Green Chemistry Initiative?**

**A.** The goal of this initiative is to develop options for green chemistry policies. To accomplish this, the California Green Chemistry Initiative will do the following:

- Define the challenges we face
- Solicit input from stakeholders
- Identify options for addressing each challenge
- Develop recommendations for action

The initiative will involve the expertise and collaboration of various state agencies and departments, including Cal/EPA, California State and Consumer Services Agency, California Health and Human Services Agency, California Department of Toxic Substances Control, California Air Resources Board, California Integrated Waste Management Board, Office of Environmental Health Hazard Assessment, California Department of Pesticide Regulation, State Water Resources Control Board, Department of Public Health, California Department of Conservation, Department of Industrial Relations, Governor's Office of Homeland Security, and others as needed.

**Q. How can I get involved in the California Green Chemistry Initiative?**

**A.** The Conversation with California, green chemistry blog provides all interested parties a forum to contribute their ideas and address the challenges of green chemistry. Visitors can provide comments at: <http://californiagreenchemistry.squarespace.com/journal/>.

The California Green Chemistry Initiative's focus is in the following four areas:

- Moving towards a Cradle to Cradle framework
- Stimulating the Green Chemistry challenge
- Identifying Toxics in Products by Design
- Identifying Toxics in Products by Accident

The creation of a viable list of options to advance green chemistry is expected to be submitted to California Environmental Protection Secretary Linda Adams by January 2008. From that list, proposed recommendations for a final policy are due by July 1, 2008.