N E W S L E T T E R---

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INVESTING IN HEALTH EFFECTS TESTING

In recent years big companies like Dow and Dupont have spent lots of money on public relations trying to emphasize the benefits of chemicals and reassure the public that the exaggerated fears of anything called a "chemical" are not justified. Results have been only partly effective.

Public-interest activists and government agencies in the US and Europe are still calling for curbs on manufacture and use of chemicals by private industry. Their demands are no longer getting as much attention by the press but the pressure on corporations in the developed world to reform are still of concern to responsible management.

Now industry is putting some funds into a research project of testing a large number of important chemicals for health and environmental effects. The purpose is to provide scientifically valid detail to balance the scales of opinion on the dangers and threats perceived by the public and the activists. The newly-named American Chemistry Council (ACC, formerly Chemical Manufacturers Association - CMA) has underwritten a $25-million/year program to develop data on health and environmental effects of chemicals. Bayer Corporation CEO Helge Wehmeier delivered some statesmanlike policy remarks about the purpose and expectations for this effort, called Long Range Research Initiative (LRI), at a recent International Petrochemical Conference. Wehmeier heads the research committee of ACC.

Chemical Week Magazine editor-in-chief David Hunter included some of Wehmeier's text in an editorial. These are some of the words quoted by Hunter. "Over the years, more and more questions have popped up as we gain new abilities to detect and measure chemicals in the environment. The public expects us to be the repository of knowledge on these matters. To the industry's credit, today we are not throwing PR and verbiage at these questions. We have begun answering them with good science."

"This is not research on individual products. It is research on the mechanisms by which chemicals affect human health and the environment. This is knowledge which the public rightly expects us to have: answers based on sound science to the questions of John or Jane Q. Public: 'How do your chemicals affect me, my children, and my environment?'"

"The LRI is in essence an expanded commitment to Responsible Care (another ACC program-Ed.). Important goals include: to identify health and environmental issues as they emerge-not after they hit the headlines; to align industry research with public priorities; to improve risk assessment

methods and to establish industry leadership on these issues and extend that leadership around the globe. Collaboration is under way between ACC, Europe's Cefic, and the Japanese Chemical Industry Association."

"LRI studies aim to complement, not duplicate, research under way within government and academia. Non-industry stakeholders are involved in decisions and advise on LRI projects. The governance, planning, and oversight of the LRI now involves 30 public participants. In designing and conducting LRI studies, authority is vested in the individual researchers to select the most appropriate methods and procedures. They do so within a framework of the most rigorous scientific principles and laboratory practices. Only peer-reviewed findings will be published. This governance system will ensure unbiased science, because, clearly, if we were to use our money to publish anything less, then we might as well save our effort, because the results would neither be respected nor accepted."

"The results of all these research projects will be made public regardless of the outcome, whether they argue for or against any one product. And no company can edit the results beforehand. Thomas Jefferson said that if we think people do not know enough to act wisely, we should not resist their power to act, but give them better information to act upon. LRI buys the industry a seat at the table of decisions on environmental and health issues about its products, or at least earns it the right to demand a seat. The LRI, as we have conceived it, buys knowledge, inclusion, and control over our fate."

BUCKYBALLS FROM SPACE

In 1985 researchers saw that the nuclear magnetic resonance pattern of various forms of carbon soot had very sharp peaks corresponding to mass numbers corresponding to 60 and 70 carbon atoms. A benzene extract of such soot was a yellow liquid whose residue contained these compounds and they were 100 percent carbon. Then followed international competition to explore the properties of this extract, characterize it and decide on a chemical structure.

The story is well known and the final choice for 60 carbons was a spherical arrangement of hexagons and pentagons. Its similarity to the geodesic dome structure invented by the visionary architect Buckminster Fuller suggested the name Buckminsterfullerene; Buckyball or fullerene for short. Views of the sphere and of arrangement of hexagons spread out in a plane show how it is constructed. Each pentagon side is defined by one side of a hexagon.

The entire 3-D structure is an aromatic molecule with some of the characteristics of benzene or naphthalene but with no bonds left over for hydrogen or other substituents. Numerous chemical derivatives of Buckyball have been made, resulting in all kinds of new properties. Another kind of stable derivative consists of an atom or small molecule that is totally surrounded by a Buckyball sphere. Some of these derivatives have electronic or semiconductor properties. This suggests novel uses in computer circuitry.

Cosmologists interested in the chemistry of outer space have recently reported finding caged atoms of argon and helium in Fullerenes (C60 to C200) in soils in China, Japan and Hungary that lie at the 250 million year old Permian-Triassic boundary. The isotope ratios of these noble gases were similar to those in the planetary component of meteorites known as carbonaceous chondrites but are

unlike that of Earth's atmosphere. They state that these data imply that an impact event (asteroidal or cometary) was responsible for the extinction of over 90% of all marine species, about 70% of terrestrial vertebrate genera, and most land plants. They conclude that the ET (extra-terrestrial) impact affected the entire global climate.

This recent report joins earlier similar fullerene-noble gas studies of soils at the 65-million year Cretaceous-Tertiary boundary (KTB) associated with a presumed ET impact causing a mass extinction at the time of the decline of the dinosaur era. Thus the element carbon is now known to exist in three pure forms: diamond, graphite and fullerene. A fourth form is similar to the spherical shapes: tubes of hexagon-pentagon carbon that are cylindrical and are sometimes capped with a half of a buckyball sphere.

In the Welch Hall of Chemistry at the Houston Museum of Natural Science there is an elaborate display of information about fullerenes and a tubular variation of carbon known as carbon nanotubes. This museum is close to Rice University where Richard E. Smalley, the chemist who shared the Nobel Prize in 1996 for the invention of Buckyballs, heads the Department of Nanotechnology. This is the new word to describe the study and use of knowledge about molecule-sized structures such as buckyballs and buckytubes.far in 2001.

HOW SWEET IT IS!

Sugar has long been used as a food sweetener. However, in the more recent past there has been a growing concern about the countless number of calories in our diets, as well as tooth decay associated with sugar consumption. The food industry has responded by producing a number of no-sugar and reduced sugar products that use saccharin, and the more popular asparaguses. Thanks to the persistent demand for alternative sweeteners, a newer product called sucralose has finally hit the market in the United States.

This sweetener has been trade-marked Splenda. The properties, uses and other information may be found at http://www.splenda.com.

Sucralose is an artificial sweetener derived from sucrose by the substution of three of the hydroxyls with chlorine atoms. It was approved for human food use the FDA in 1998. The synthesis process is a six-step sequence of reactions that substitutes chlorine atoms for specific hydroxyls. The product and process were discovered and developed by Tate and Lyle in Britain and Canada and have also been worked on By McNeil Specialty Products Co. in the US.

Extensive animal and human testing found no significant health effects, including birth defects and cancer. It does not metabolize in the body but it has a remarkable sugar-like sweetness, 320-1000 times that of sucrose. It is soluble in water, readily formulated in foods and beverages, survives cooking and baking and is stable when stored. Significant health advantages for its use include no effect on diabetic patients and no tendency to promote caries in teeth. Already diabetics and weight loss people are enthusiastic about Splenda and, of course, the natural food ones are equally opposed. It is satisfying to chemists that chlorine has been put to use in such a benign and sweet way.

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FREEAGENTNATION.COM
This site has lots of links and delivers an e-mail newsletter that includes essays and stories from people who run their own businesses or free-lance services. One of the essays considered some familiar questions for consultants: "I'm not getting paid! What can I do about it?"; "I'm so busy doing a project that I never have time to market myself to potential clients."; "I'm out of the loop. I miss that water cooler. I don't know what's going on."; "My client is driving me crazy. He's worse than my boss ever was!"; "I'm never off work."; "I'm off-balance all the time. I can't get in a rhythm." The answers were thoughtful and well stated. The site covers much more than this. http://www.freeagentnation.com

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This site offers e-business forums, information and news for the Chemicals industry. They promise a window to cutting edge technologies and how they're impacting the industry. It provides news, webcasts of past conference presentations and video interviews, information on upcoming conferences, industry research and reports, and analysis of the latest industry trends. It publishes the e-business for Chemicals Newsletter, which comes out twice a month. http://www.eyeforchem.com