

DVDs and CD-ROMs that thwart global warming

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Chemists have developed greener ways to manufacture plastics, such as material found in CDs and beverage bottles, from waste CO₂. Credit: Photo by the American Chemical Society

Carbon dioxide removed from smokestack emissions in order to slow global warming in the future could become a valuable raw material for the production of DVDs, beverage bottles and other products made from polycarbonate plastics, chemists are reporting.

In separate reports scheduled for presentation today at the 235th annual meeting of the American Chemical Society, Thomas E. Müller, Ph.D., and Toshiyasu Sakakura, Ph.D., described innovative ways of making polycarbonate plastics from CO₂. Those processes offer consumers the potential for less expensive, safer and greener products compared to

current production methods, the researchers agreed.

“Carbon dioxide is so readily available, especially from the smokestack of industries that burn coal and other fossil fuels,” Müller said. He is at the new research center for catalysis CAT, a joint 5-year project of RWTH Aachen and industrial giant Bayer Material Science AG and Bayer Technology Services GmbH. “And it’s a very cheap starting material. If we can replace more expensive starting materials with CO₂, then you’ll have an economic driving force.”

In another ACS presentation, scientists from Japan also reported using CO₂ as an alternative feedstock to change carbonates and urethanes into plastics and also battery components. Sakakura, the team’s lead researcher, noted that the new process is simpler and faster than another process developed by a Japanese firm. Sakakura is with the National Institute of Advanced Industrial Science and Technology in Tsukuba, Japan.

Müller pointed out that millions of tons of polycarbonates already are sold each year with the volume rising. Perhaps no other consumer product has such a great potential for use in removing carbon dioxide from the environment, he added. These hard, tough materials represent “intriguing sinks” for exhaust carbon dioxide and are the mainstay for producing eyeglass lenses, automotive headlamp lenses, DVDs and CDs, beverage bottles, and a spectrum of other consumer products.

Trapping carbon dioxide in those plastics would avoid the release of many million of tons into the environment, Müller said. “Using CO₂ to create polycarbonates might not solve the total carbon dioxide problem, but it could be a significant contribution.”

Consumers may be drinking from a carbon dioxide product and watching movies on waste-CO₂ DVDs sooner than they think. “I would

say it's a matter of a few years" before CO₂-derived polymers are available to the public.

Source: American Chemical Society

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