Catalyzing Sustainable Prosperity
Paul Anastas, Yale Center for Green Chemistry and Green Engineering

Summary

In his keynote address, Paul Anastas considered and countered the arguments against green chemistry.

The Pacific Northwest, he said, is a leading force in advancing green chemistry education and implementation.

“What’s taking place in the Pacific Northwest is the culmination of tremendous efforts of many of you,” Anastas said. “This is the culmination of some fundamentally important work. It’s redesigning the basis of our society, our economy to be more sustainable than the frankly tragic trajectory we are on.”

To succeed, green chemistry must become part of the normal considerations of running a business. One estimate said that green chemistry will grow to a $98.5 billion industry by 2020.

Green chemistry was once thought of as being limited to biobased materials. Then people thought of it as only dealing with aqueous solutions, then it was about synthetic methodologies. And, as time went on, green chemistry has come to encompass the full range of material science.

“All we have in this world is energy and matter, including all of that matter that is involved in our economy,” Anastas said.

Anastas talked about the “lies the status quo tells us.” Much of the status quo common sense about innovation is wrong and can lead people astray. People assume things will continue on the same course forever.

“The status quo stays the same right until it doesn’t,” Anastas said.

When we look at functions like those the planet’s ecosystem provides, we think they are valueless because we don’t measure what they contribute.

“Einstein supposedly had a slide in his office that said not everything that counts gets counted not everything that gets counted counts. We know that the most important things in our lives are the most difficult to measure – health, beauty, love.”

Green chemistry, Anastas said, is not about doing things a little less bad. It’s about thinking differently and creating things that are sustainable and deliver superior function and performance.

Nature can show us the way, through examples like geckos' feet and abalone shells. Nature can create ceramics at ambient temperatures and pressures that humans need ovens burning at thousands of degrees to create.

"Doing it under water is just to show off," Anastas said.

Leapfrog improvements should be the goal. Coffee used to be decaffeinated with toxic methylene chloride. Now, the industry uses supercritical carbon dioxide. The leapfrog improvement would be to create natural hybrids that are caffeine-free. Instead of reducing the chemicals in laundry detergents, we can perhaps design clothes that are self-cleaning.

"I'm going to close by talking about the future and what the future is going to be: I have no idea and neither do you," Anastas said.

3-D printers offer an example. At first, they produced trinkets. Now, it's livers, pancreases, even houses.

"This is clearly a killer app. Will something kill the killer app? I don't know," Anastas said.