SCIENCE / TECHNOLOGY

APRIL 23, 2007 | VOLUME 85, NUMBER 17 | P. 42

Cold Fusion Makes Its Case In Chicago

ACS Meeting News: After 18 years on the fringe, the field is still trying to gain respect

Steve Ritter

By Steve Ritter

In a meeting room tucked away in a far corner of Chicago's mammoth McCormick Place Convention Center, a small band of faithful cold fusion researchers and advocates gathered on March 29, the final day of the American Chemical Society national meeting, for a symposium to showcase evidence in support of the original cold fusion findings that were announced at a press conference 18 years ago.

This time, the speakers conceded that the massive amount of cheap, pollution-free energy once hoped for by fusing deuterium nuclei at room temperature was not likely to be achieved anytime soon, if ever.

First Generation Palladium-deuterium codeposition cell was used in early cold fusion research.
Courtesy of Steven B. Krivit

Back in 1989, electrochemists Martin Fleischmann of the University of Southampton, in England, and B. Stanley Pons of the University of Utah made the stunning announcement that they had achieved sustained fusion of deuterium atoms that diffused into the palladium cathode of an electrochemical cell containing heavy water (deuterium oxide). Dozens of research labs worldwide immediately began trying to repeat the experiments. There were a few scattered confirmations of excess heat or telltale signs of fusion in the form of helium, tritium, and other by-products, but the results could not be reproduced on demand.

Many researchers ascribed the unpredictable effects to artifacts or sloppy lab work. Fusion fever quickly abated, and most scientists dismissed cold fusion as an embarrassing mistake.

Although the field has been relegated to the fringes of science, a band of reputable researchers quietly continue to study "low-energy nuclear reactions," as cold fusion is now called. The researchers are not really expecting to prove deuterium fusion is occurring, but they are looking into the possibility of nonfusion nuclear reactions, including transmutation of heavy elements into other elements. In Chicago, some of these scientists got a rare opportunity to report their research in a major forum, although few came to listen.

"Even though cold fusion is considered controversial, the scientific process demands of us to keep an open mind and examine new results," commented Gopal Coimbatore, a researcher in the Institute of Environmental & Human Health at Texas Tech University. Coimbatore served as the Chicago program chair for the Division of Environmental Chemistry, which sponsored the symposium. With a potential global energy crisis looming, "it behooves the scientific community to look at all options available," Coimbatore told C&EN.

Steven B. Krivit, editor of the online magazine New Energy Times, led off the symposium with an overview of the history of cold fusion from its inception to the present. Krivit explained that Fleischmann and Pons made some mistakes in their early experiments and in how they announced their initial findings and later interacted with the scientific community and the media. But some aspects of the original findings have held up to scrutiny, Krivit believes. Significant data, he claimed, now show that the observed excess heat produced during the experiments and the formation of by-products, primarily helium and tritium, are real. And the reproducibility of experiments has gotten much better, he noted.

"It might be fusion, or maybe it's not," Krivit observed. "But something interesting is going on." Still, with the field's reputation "in the doghouse" for the past 18 years, Krivit said, he doesn't expect the new results to be embraced overnight.

One of the original criticisms of the Fleischmann-Pons research was alleged errors in measuring excess heat generated during the experiments. In Chicago, longtime cold fusion researcher Melvin H. Miles, now a chemistry professor at the University of La Verne, in California, presented a thorough analysis of live and blank cold fusion calorimetry experiments dating back to the 1990s. He showed that the precision of the measurements left only one conclusion: The excess heat observed must be the result of nuclear events because the energy released is greater than can be explained by any known chemical reaction.