

R&D 100 AWARDS

Pea-size Pellets a Key to Advanced Power Generation

“Don’t count coal out yet,” said Dr. Ranjani Siriwardane, scientist at the National Energy Technology Laboratory (NETL) as she showed off the “magic rocks” that *R&D Magazine* calls one of the 100 most significant technology developments of the year 2000.

Dr. Siriwardane and her partner Daniel Cicero were selected to receive the prestigious R&D 100 award — the award that the *Chicago Tribune* has called “The Oscars of Invention.” Others have referred to the R&D 100 Awards as the “Nobel Prizes of Applied Research.” Past winners (since 1963) have included breakthroughs like Polacolor film, the flashcube, the digital wrist-watch, antilock brakes, the automated teller machine, the liquid crystal display, the halogen lamp, the fax machine, and high definition TV.

Though her invention *RVS-1: the regenerable desulfurization sorbent*, will probably never be a household word, the cheap, coal-fired electricity made clean by RVS-1 may soon be powering our homes.

RVS-1 looks like bunny chow, but acts like a sponge — a remarkably efficient sponge — to remove sulfur from gasified coal used to power turbines that generate electricity. The result? Coal-fired power generation with no sulfur oxide emissions to end up as acid rain.

Cicero, who handled the commercial development of the invention, said “although the concept of using a sorbent to remove sulfur is not new, what is new about RVS-1 is that it removes nearly all the sulfur, removes it efficiently because it can withstand the high temperatures of gasification, and can be used over and over again. It’s regenerable.”



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**NETL BOASTS
FOUR PREVIOUS
R&D 100 AWARD
WINNERS:**

1992

University of Pittsburgh Medical Center researchers solved clotting problems in heart assist device with NETL-patented imaging technique.

1994

The Babcock and Wilcox Company developed Low NO_x Cell Burner™ retrofit technology to help meet emissions control standards.

1995

CEMROX-Ceramic membrane reactor designed to convert methane into synthesis gas.

1996

Core separator engineered by LSR Technologies, Inc. to provide efficient, cost-effective particulate air toxics control.

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100 grams of RSV-1 sorbent will absorb 20 grams of sulfur before needing to be cleaned. Hot air is used to cleanse the pellets and generate a concentrated stream of gaseous sulfur dioxide, gas that can be recycled at a sulfuric acid plant or used to make elemental sulfur.

How many times can it be reused? We don't know. The zinc oxide based pellets have been used, cleaned, and reused up to 50 times, and Dr. Siriwardane predicts that "It may even go to 100 or 200 cycles."

All this at a cost up to 50 times less than competing products. The exclusive right to produce RVS-1 has been licensed to Süd Chemie (formerly United Catalysts Inc.) of Louisville, Kentucky.

The development of RVS-1 is a leapfrog advancement in state-of-the-art coal and fuel gas cleaning. Dr. Siriwardane was able to develop a simple solution — 20 years in the making — to a very complex longstanding quandary in advanced power generation.



The regenerable desulfurization sorbent RVS-1