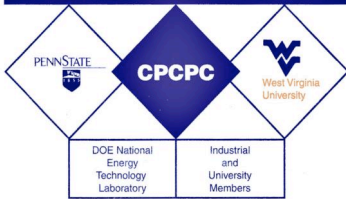


Nuclear-Grade Graphite From Coal

Consortium for Premium Carbon Products from Coal



Project Lead Organization

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Project Funding

DOE	\$ 88,912
Non-DOE	\$ 97,140
Total	\$ 186,052

Period of Performance

March 1, 2002 to February
28, 2003

Background/Description

It is estimated that at least 50,000 MW electric of new nuclear capability will be in place by the year 2020 in the U.S. The Pebble Bed Modular Reactor is viewed as the preferred technology. Each such reactor requires about 800 tons of isotropic graphite.

The composite membrane will consist of an ultra-thin (0.1-0.5 μ m) silica layer of dense silica coated onto an intermediate, thin (5-10 μ m), small-pore (2-4 nm) layer of mesoporous or microporous silica, that in turn is coated onto a thick (1mm) large-pore alumina tube. The research effort includes synthesis of the intermediate and the final layers, characterization of the porous structure, and hydrogen separation measurements.

Goal

Coal-derived cokes, produced by WVU by solvent extraction methods, have been blended with conventional pitch and fashioned into graphite billets for testing at GrafTech. Novel iso-molding techniques have been employed in the fabrication of these billets.

Thus far, smaller test specimens have been tested with promising results. Over 50 pounds of calcined coke have been supplied to GrafTech by WVU for the fabrication of the larger billets (150 mm) which are currently under test.

Benefits

The commercial potential for such a project is vast. Nearly 400,000 tons of nuclear graphite will be needed for the construction of 500 reactors. The potential value for this graphite is estimated at around \$4 billion. It is anticipated that the coal-derived isotropic graphite will have superior properties and cost much less than conventional feedstocks