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**Title of Paper** (ten words or less): Low Cost, Lignin-Based Carbon Fiber for  
Transportation Applications

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**Invited paper?** No

**If yes, solicited by:**

**Abstract:**

The Department of Energy Freedom Car Program has shown that, by lowering overall weight, the use of carbon fiber composites could dramatically decrease domestic vehicle fuel

consumption. For the automotive industry to benefit from carbon fiber technology, fiber production will need to be substantially increased and fiber price decreased to \$3 - \$5 / lb.

To achieve this cost objective, alternate precursors to pitch and polyacrylonitrile (PAN) are being investigated as possible carbon fiber feedstocks. From many high-volume, renewable or recycled materials, lignin and lignin blends were selected based on low cost, high-volume, and ability to melt-spin fiber.

Current studies have focused on the use of high-lignin blends which can be melt-spun to produce small tows of 10-20 micron non-sticking, drawable filaments. The fibers have attractive yields and can be readily stabilized, carbonized, and graphitized. Additionally, lignin could be produced in quantities sufficient for extensive use in transportation applications. Examination of the physical structure and properties of carbonized and graphitized fibers indicates the feasibility of use in transportation composite applications. Current studies are focusing on detailed examination of methods to improve lignin purification and devolatilization during multifiber spinning.