

Industrial Carbon Fiber from Lignin Feedstock Blends

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Pulp mills are presently the largest integrated biorefineries. With support from the Department of Energy Freedom Car Automotive Lightweighting Program, melt spun blends of Kraft lignins and routinely recycled polymers have been evaluated as carbon fiber feedstocks. The goal is development of an industrial grade carbon fiber for use in automotive composites. Bench-scale investigations of a variety of melt-spun single fiber blends and larger scale investigations of melt-spun multifilament lignin-blend fibers have been performed using desalted commercially available Kraft lignin. Evaluations of carbon fiber yields, properties, production conditions, and likely production costs indicate that carbon fibers from lignin blend feedstocks have the potential to meet automotive needs. Current investigations are moving into areas, such as pre-process lignin purification, alloying, spinning, and spooling techniques needed for larger scale carbon fiber precursor preparation.