

MWP – Young Researcher Abstract 2023

Project title: HighPerCell _{Carbon} [®] : Carbon Fibers from Cellulose	
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Abstract (approx. 200 words): <p>Carbon fibers (CFs) are high performance materials with a remarkable weight-to-strength ratio. Currently CFs are made from two non-renewable resources; these are petroleum-based (polyacrylonitrile) and coal-based (pitch) precursor fibers. Besides the economic aspects with an ever-increasing demand for CF-materials, the ecological aspects must not be neglected. Thus, there is an urgent need for an inexpensive, more sustainable CF-precursor.</p> <p>We developed the novel HighPerCell_{Carbon}[®] process which enables the production of carbon fibers made from cellulose. The technology is based on dry-jet wet-spinning of cellulosic precursor fibers using an ionic liquid (IL) as direct solvent in a closed loop spinning process. The cellulosic filaments are converted into CFs by a continuous low-pressure-stabilization and subsequent carbonization. Fortunately, no toxic byproducts are formed throughout the process chain. The developed CFs are a sustainable alternative to the currently used petroleum-based systems. And we believe that our gained understanding is of significant importance to facilitate the industrial development of sustainable low-cost high-end carbon fiber reinforced materials.</p>	
Key words: Cellulose, ionic liquids, HighPerCell [®] , dry-jet wet spinning	