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Editorial

Editorial for the Special Issue on Carbon Fiber Composites

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Carbon fibers (CFs) have received tremendous attention since their discovery in the 1860s due to their unique properties, including outstanding mechanical properties, low density, excellent chemical resistance, good thermal conductivity, etc. [1–3]. CFs are widely applied in energy storage/conversion, sports, wind energy, electronics, etc. [4,5]. Additionally, with continuous efforts and ever-growing demand, CFs are widely utilized to reinforce composite materials because of the abovementioned characteristics, which have received remarkable interest [6].

The collection of papers in this Special Issue may provide new insights regarding the development of CFs and their composites from both experimental and simulation perspectives, advancing technology and facilitating the practical application of these devices. Various candidates, including metal, polymer, inorganic materials, etc., have been explored and implemented in composites [7–9]. Meanwhile, factors such as starting materials, structural designs, compositions, etc., which may affect the overall properties of the resultant composites, have been thoroughly investigated [10–13]. For example, Adeniran et al. studied the influence of fiber content on the compressive properties of the prepared composites [14]. A method proposed by Martinez et al. was used to analyze the spread-flow kinetic effect of fluid drops on the unidirectional fiber beds [15]. Additionally, computational studies have been performed to assist in better understanding the impact of different parameters [16,17].

Preparing these composites (i.e., curing, cyclic compression, cyclic temperature, etc.) is still crucial since processing parameters also play critical roles in determining their final properties [18–22]. The curing reaction progress, which can help to monitor the quality of prepared parts, was measured by Kyriazis et al. [23]. In addition to studying these parameters, different strategies have been discovered and used to prepare the composites [24–26]. For instance, Moazed et al. developed and plotted structural indices and efficiency metrics in design charts in order to better select parameters [27]. In contrast to the traditional structural function, Li et al. used the carbon fiber composite for catalysis [28]. Moreover, a critical review of the broad applications of carbon fibers and their composites in renewables, sensing, and tissue engineering is also presented [29].

This Special Issue covers experimental designs and computational studies, moving from discussions of principles, parameter optimization, and manufacturing to end uses. It may provide new methods and advanced technologies that could help us to better understand these approaches to the unique characterization and modeling of carbon fiber composites, facilitating their practical application.

Conflicts of Interest: The author Jiadeng Zhu was employed by the Brewer Science Inc. company. All authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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