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PLASMA MODIFICATION OF NATURAL FIBRES TO IMPROVE ADHESION IN BIO-COMPOSITES

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Abstract. Due to environmental and sustainability concerns, natural fibers have become an important class of reinforcing materials in composites. The biggest problem in the development of composites is the poor adhesion of the fibers in the matrix. Plasma technology has been proven many times to be a suitable method for improving the interfacial properties of composites. However, most of these studies have been carried out on synthetic polymers. The most used pretreatments of natural fibers for reinforcing materials are alkali or acetylation treatments. To reduce or even eliminate the use of synthetic polymers in the development of textile bio-composites and eliminate the wet chemical pretreatments of reinforcing materials, it is crucial to conduct extensive research on plasma treatment of natural reinforcing materials to improve adhesion within the bio-composite. Plasma-induced chemical, physical and chemical changes on flax, coir and cotton fibers for their incorporation into bio-composites will be discussed. In addition, the importance of plasma pretreatment in all- cellulose composites will be discussed in detail.

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