

Insight into mechano-chemical properties of the interface between cellulose and thermoplastic polymers

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Development of smart composite materials based on natural polymers can have many applications in different industries, such as automotive industry. One of the most used natural polymers is cellulose characterized by unique mechanical properties. Furthermore, cellulose is a widely distributed polysaccharide in nature and is the main load-bearing constituent in plants. This kind of composite is a promising and sustainable green material to achieve durability without using toxic chemicals. One of the most influence key in designing natural fiber/polymer composite is the interfacial adhesion of the fiber with the matrix, so, in this paper, we propose a method to investigate the mechano-chemical properties of the interface between cellulose and thermoplastic polymers. This method is based on molecular dynamics simulations and provides essential information in optimization of the manufacturing technique of composite materials used in automotive industry.

Keywords: composite materials, cellulose, thermoplastic polymers, automotive industry