

LIGNO-CELLULOSE AS A POTENTIAL SOURCE FOR NOVEL REINFORCEMENT, CURING ACTIVE AND COUPLING AGENTS IN RUBBER PRODUCTS

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Ligno-cellulose is a renewable source from living plant and animal materials, such as wood and agricultural residues. Ligno-cellulose has been identified as an attractive source of some products for starting materials such as starch, lignin and cellulose fibers for a wide range of material products. Cellulose fibers are being used as potential reinforcing materials because of so many advantages such as abundantly available, low weight, biodegradable, cheaper, renewable, low abrasive nature, interesting specific properties, and exhibit good mechanical properties. Cellulose fibers also have some disadvantages such as moisture absorption, quality variations, low thermal stability, and poor compatibility with the hydrophobic polymer matrix such as polyethylene and polypropylene. Therefore study was performed by chemical treatments such as alkalization, bleaching and hydrolysis, to anticipate their disadvantages. The treatments obtain some advantages such as cellulose fibrillation into micro-fibrilated and nano-fibrilated celluloses, obtaining an enhancement in some properties such as mechanical and thermal properties and crystallinity of some polymers. Furthermore, cellulose is a versatile multi-purpose building block due to the presence of reactive functional groups, viz. a hydroxy and a ether group. Cellulose may be considered as a starting material to build versatile polymer derivatives such as noval polyurethanes. Addition to polyurethanes, cellulose may be converted to a number of derivatives through a novel grafting it onto hydrophobic materials such a natural rubber. Cellulose can therefore be a potential source into raw materials through functionalizing for novel polymer derivatives and chemicals, used in various products such as curing active and coupling agents in natural rubber products

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