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Chitin and shrimp shells liquefaction and their use in blend membranes

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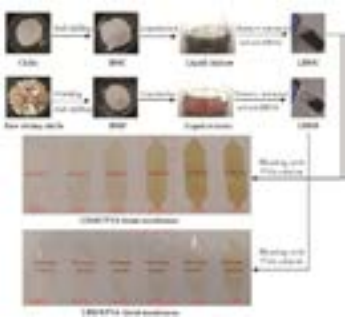
To expand the applications of fishing industrial wastes, the liquefaction technique was employed to convert chitin and shrimp shells into liquids, which were first further used to for the modification of polymer materials. Ball-mill treated chitin and shrimp shells were effectively liquefied into polyols, namely LBMC and LBMS, respectively, by liquefaction technique. FTIR, NMR and GPC analyses of liquefied products turned out that depolymerization and deacetylation reactions occurred during liquefaction process. LBMC/PVA and LBMS/PVA blend membranes with various LBMC or LBMS content were prepared and characterized by FTIR and SEM investigation. In addition, tensile strength, elongation at break, water content, degradation and antibacterial properties were thoroughly discussed. The mechanical property and thermal stability were greatly enhanced under the optimal optimized conditions of 0.6 wt% incorporation of liquefied chitin incorporation to PVA. In particular, the antibacterial activity was obviously improved after the incorporation of LBMC or LBMS.



Recent Publications

1. Jie Zhang, Wen-Rong Xu, Yu-Cang Zhang, Wei Li Jia-Dan Hu, Feng-Yi Zheng, Yang-Tian Wu (2018) Liquefied chitin/polyvinyl alcohol based blend membranes: preparation and characterization and antibacterial activity. Carbohydrate Polymers 180: 175-181.
2. Wen-Rong Xu, Guang-Jie Xia, Hak-Fun Chow, Xiao-Ping Cao, Dietmar Kuck (2015) Facile assembly of chiral metallosquares by using enantiopure tribenzotriquinacene corner motifs. Chemistry A European Journal 21(34): 12011-12017.
3. Wen-Rong Xu, Hak-Fun Chow, Xiao-Ping Cao, Dietmar Kuck (2014) Regiocontrolled synthesis and optical resolution of mono-, di-,and trisubstituted tribenzotriquinacene derivatives: key building blocks for further assembly into molecular squares and cubes. The Journal of Organic Chemistry 79(19):9335-9346.
4. Tao Wang, Yu-Fei Zhang, Qin-Qing Hou, Wen-Rong Xu, Xiao-Ping Cao, Hak-Fun Chow, Dietmar Kuck (2012) C3-symmetrical tribenzotriquinacene derivatives: optical resolution through cryptophane synthesis and supramolecular self-assembly into nanotubes. The Journal of Organic Chemistry 78(3):1062-1069.

Biography

Wen-Rong Xu has her expertise in chitin biomass conversion and applications, as well as organic synthesis and supramolecular chemistry. Her research group has successfully converted the chitin biomass into polyols through the simple and effective liquefaction method, and the resulting polyols were further used for the polymer modification. This research has opened a new way for the high-value added use of fishing industrial wastes.

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