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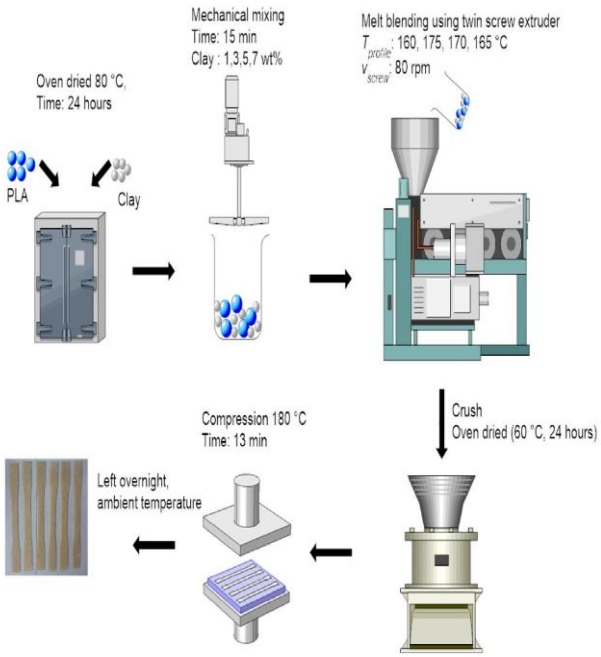
## RESEARCH HIGHLIGHTS

### 1. Effects of polylactide-nanoclay (PLA/MMT) surface modification on non-isothermal crystallization green nanocomposites.




Polylactide (PLA) is a biodegradable thermoplastic material that exhibits superior mechanical properties, excellent transparency and processability, non-hazardous degradation, and renewability. Due to the synthetic nature of biodegradable polymers, current production of biodegradable plastic is expensive. PLA has notable demand because of inherent versatility of applications in aforementioned fields. Montmorillonite (MMT) is emerging as a potential alternative material due to its low cost, biodegradability, and availability. However, the incompatibility of MMT (hydrophilic) fillers with PLA (hydrophobic) matrices continues to be a significant barrier to progress in the research. The new UV/$O_3$ compatible clay-reinforced PLA composite is expected to improve mechanical strength, reduce applied weight, and retain biodegradability, making it suitable for a variety of low-cost short-term applications.

### 2. UV/O3 treatment as a surface modification of rice husk towards preparation of novel biocomposites

Surface modification of the fiber surface was carried out to improve the adhesion between fiber and matrix. In this study, the effect of surface modification of RH via alkali, acid and ultraviolet-ozonolysis (UV/ $O_3$) treatments on the properties of composites recycled high density polyethylene (rHDPE) composites was investigated. The untreated and treated RH were characterized by Fourier Transform Infrared (FTIR). As compared to untreated RH, all surface treated RH exhibited rougher surface and showed improved adhesion with rHDPE matrix. UV/$O_3$ treatment can be served as an alternative new method to modify RH surface in order to improve the adhesion between hydrophilic RH fibre and hydrophobic rHDPE polymer matrix.