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Influence of filler loading and palm oil-based green coupling agent on torque rheological properties of polypropylene/cocoa pod husk composites

([📄 Article in press](#) [?](#))

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Abstract

This research examined the torque rheological properties of cocoa pod husk (CPH)-filled polypropylene (PP) composites. Composites with varying filler loading ranging from 10 to 40 phr and formulation with or without palm oil-based green coupling agent (GCA-P) were analyzed using a Brabender Plastrograph torque rheometer. The GCA-P synthesized from fatty acid of palm oil was used to enhance adhesion at the filler-matrix surface interfaces. The results reveal that PP/CPH composites containing 40 phr filler loading and GCA-P exhibited higher processing torque and power law index (n). Higher melt viscosity was recorded at higher filler loading, owing to filler agglomeration and more effective filler-matrix adhesion in the presence of GCA-P. As a result, higher energy was required to compound PP/CPH composites, which could be attributed to the increase in activation energy (E_a) at higher melt viscosity. © 2017 Wiley Periodicals, Inc.

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