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**The compatibility effects of irradiated recycled PP on the mechanical and water properties of recycled PP/microcrystalline cellulose composites** (Conference Paper)

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## Abstract

Polypropylene (PP) is a thermoplastic that is used in many applications. Hence, the recycling of PP is very important for the sustainability of the environment. However, the properties of recycled PP (rPP) are lower compared to virgin polypropylene due to the rupturing of its structure during the recycling process. One of the techniques that can be used to modify the polymer structures is electron radiation. This study was aimed at investigating the compatibility of irradiated rPP in rPP composites reinforced with microcrystalline cellulose (MCC). The rPP/MCC composites were prepared according to the ratio of 70/30 wt% (unirradiated/irradiated) rPP, before the addition of various compositions of MCC at 5, 20 and 40 wt%. The rPP resin pellets were irradiated with 5, 20 and 50 kGy before the compounding process. Mechanical and water resistance tests were conducted to evaluate the compatibility of the composites. The results showed that the mechanical properties were improved at a certain electron radiation dosage and MCC loading. Although the water resistance deteriorated at higher MCC loadings, the radiation dosage did not influence this property. © 2016 Author(s).

## Author keywords

cellulose; irradiation; mechanical; polypropylene; water uptake

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