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CARBONISATION MECHANISM OF PET

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ABSTRACT

Thermal decomposition of PET has been extensively reported in the literature and recently reviewed, showing that most of previous work concerns the formation of volatile products, whereas much less attention has been given to charring occurring during PET thermal degradation [1-4]. On the other hand, understanding of charring mechanisms in polymer thermal decomposition is of paramount importance because it may provide a most suitable, environmentally friendly approach to fire retardance of polymer materials. Indeed, charring occurs in competition and at the expenses of formation of volatile combustible products from the polymer exposed to fire conditions.

In this work a detailed molecular characterisation has been carried out of the volatiles and of the residues produced by thermal degradation of PET. This has enabled us to identify the mechanisms reported in the literature which are relevant to PET thermal decomposition, thus providing an integrated mechanism for both volatilisation and charring of PET in the combustion process. The results of this work can be useful for designing of fire retardants for PET.

References

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