Polímeros: Ciência e Tecnologia
ISSN: 0104-1428
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Associação Brasileira de Polímeros
Brasil

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The Effect of Di-(-2-ethyl hexyl) phthalate (DEHP) as Plasticizer on the Thermal and Mechanical Properties of PVC/PMMA Blends

Polímeros: Ciência e Tecnologia, vol. 24, núm. 4, julio-agosto, 2014, pp. 428-433
Associação Brasileira de Polímeros
São Paulo, Brasil

Available in: http://www.redalyc.org/articulo.oa?id=47032470004

Abstract

Plasticizers play a key role in the formulation of polymers and in determining their physical properties and processability. This study examines the effect of di(2-ethyl hexyl)phthalate (DEHP) as plasticizer on the thermal and mechanical properties of PVC/PMMA blends. For that purpose, blends of variable composition, from 0 to 100 wt%, were prepared in the presence (15, 30 and 50 wt %) and in the absence of di(2-ethyl hexyl)phthalate. The thermal degradation of the blends was investigated by thermogravimetric analysis (TGA) in an atmosphere of synthetic air in the temperature range of 50-550°C. The variation of the mechanical properties, such as tensile behavior, hardness and impact resistance, were investigated for all blend compositions. The effect of the plasticizer on the same properties was considered. The results obtained show that a range of properties can be generated according to the blend compositions. Therefore, the addition of PMMA to the blends stabilized PVC, for the initial thermal degradation, and the addition of the plasticizer caused a decrease of stress at break and Young modulus.

Keywords

PVC/PMMA blends, mechanical properties, thermogravimetric analysis, DEHP.