Thermogravimetric analysis of silicone/clay nanocomposites

김응수, 윤진산*
인하대학교 고분자공학과
(jsyoon@inha.ac.kr*)

Difunctional hydroxyl-terminated poly(dimethylsiloxane) (PDMS) was used to synthesize end-linked networks in bulk state. Silicone rubber cured with PDMS, tetrafunctional cross-linkers and tetrapropyl orthosilicate (TPOS) Γ-aminopropyl triethoxy silane (APTES) was added to introduce amine groups to the silicone rubber. In addition, the silicone rubber was compounded with Cloisite®25A(C25A), C20A and C30B. Higher degree of exfoliation of the silicate layers was obtained in all of ! the silicone/clay composites. The kinetics of the thermal degradation and thermal stability of the silicone rubber and its composites with C25A, C20A and C30B was studied by the thermogravimetric analysis under a nitrogen atmosphere at different heating rate. The activation energy for the thermal degradation was determined by way of the Flynn-Wall-Ozawa's method and the Kissinger one. The measured activation energy of the silicone/clay composites indicated that the composites with exfoliated clay platelets was more thermally stable than that of the pristine silicone rubber.

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