Microthermal Analysis of Rubber-Polyaniline Core-Shell Microparticles Using Frequency Dependent Thermal Responses

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摘要

Alternating current (ac) thermal microscopy and microthermal analysis have been utilized for the investigation in the surface thermal conductivity imaging and local thermal analysis (LTA) of polybutadiene-polyaniline core-shell microparticles. The significant variances of thermal conductivity and stiffness between rubber and conducting polymer revealed the remarkable responses in the microthermal analysis. The depth-dependent thermal microscopy controlled by the heating frequency distinguished the rubber core, which was buried under few micron thickness of polyaniline out layer. Local thermal analysis also demonstrated the heat penetration-dependent sensor response from the rigid polyaniline shell to soft polybutadiene core. These experimental results confirmed the core-shell structure of these microparticle materials, as well as the continuous conducting phase of polyaniline. [References: 20]