

Abstract Submitted
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Morphology Evolution and Dynamic Viscoelastic Behavior of Ternary Elastomer Blends under Shear¹ XIA DONG, XIANGGUI LIU, CHARLES C HAN, DUJIN WANG, Beijing National Laboratory for Molecular Sciences, CAS Key Laboratory of Engineering Plastics, Institute of Chemistry CAS — The influence of nanoparticle geometry, such as size and shape, on the phase morphology of partially miscible binary polymer blends under and after shear has been examined by rheological and rheo-optical techniques. The phase morphologies of the solution-polymerized styrene-butadiene rubber and low vinyl content polyisoprene (SSBR/LPI) blend systems were affected by the dispersion status of fillers which were determined by filler shapes and shear strength. Under weak shear flow, the domain morphology of the OMMT filled blend was much thinner than that of the SiO₂ filled blend. Under strong shear flow, the string-like phase interface of the OMMT filled blend was much blurred compared with that of the SiO₂ filled blend. After shear cessation, the orientation status of OMMT sheets determined the orientation of newborn domains. Combined morphology observation and rheological analysis showed that the anisotropic structure and the unfavorable bending energy of OMMT sheets played important roles on phase morphology and its evolution process during or after shear.

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