



**TOUGHENING OF THE CELLULOSE ACETATE COMPATIBILIZED POLY (VINYL CHLORIDE)
(PVC)/STARCH BLENDS BY METHYL METHACRYLATE-BUTADIENE-STYRENE (MBS) CORE/SHELL
RUBBER PARTICLES**

A. Javadi*, N. Mohammadi, G. Mashayekhi

Polymer Engineering Department, Amirkabir University of Technology, P.O.Box 15875-4413 Tehran, Iran.

**Corresponding author: ajavadi@aut.ac.ir*

Toughening of the PVC and its reinforced version containing 25 phr of the cellulose acetate compatibilized starch was conducted and compared using 20 phr of the MBS core-shell particles. The results showed 60 °C increase in the brittle-ductile transition (BDT) of the toughened PVC by its reinforcement. In addition, the maximum impact strength of the toughened PVC at room temperature decreased by as much as 95 percent by the reinforcement at comparable number density of the core-shell particles in the PVC ligament. The impact strength decline and the BDT increase of the hybrid PVC system was attributed to the shear deformed matrix volume fraction decrease, diminish of the propagation rate of shear deformation around each particle despite the process zone size increase. Finally, maximum impact strength of the hybrid system at 60 °C (its BDT) was about 25 percent of the toughened PVC at its own BDT (0 °C). The observed toughness efficacy improvement by the test temperature rise was assigned to the matrix shear deformation growth rate enhancement and the process zone size increase.