

ENHANCING THE PROCESSABILITY OF HIGH DENSITY POLYETHYLENE USING DIFFERENT NANOCCLAYS

Ibnelwaleed A Hussein, Adesina Ayuba Adegoke*

KFUPM - Eastern - Saudi Arabia

This research involves investigating the effect of different modifiers and aspect ratio of the organoclay on the processability of high density polyethylene (HDPE). Improvement in the processing will be assessed on the basis of shifting the melt fracture behavior of HDPE resins to higher shear rates; hence increasing the production. Also, the impact of these organoclays on the shear thinning and extensional rheology of HDPE will be assessed. Two different compounding strategies will be examined. The effect of mixing on the HDPE instability and its rheology will be critically analyzed. The dispersion and the orientation of these organoclays will be investigated by SEM and X-Ray diffraction techniques. Then, the proper type of organoclay that improves the processability will be determined. Thereafter, the comprehensive shear and extensional rheological characterization will be performed based on very small amount of this organoclay (500 to 5000 ppm) in HDPE matrix to relate rheology to processing. Acknowledgement: This research is supported by KACST under project # AT-27-107. KFUPM is also acknowledged for supporting this research.