

CHAPTER V

CONCLUSIONS

1. The mechanical properties results indicate that the composites prepared by the old method and new method are essentially the same.
2. The expansion of interlayer spacing from XRD analysis of pure clay and modified silicate clay suggests that aminosilane coupling agent intercalates into the silicate layers.
3. The expansion of interlayer spacing from XRD analysis of nanofiller and the formation of amide group of the filler show that the modified silicate clay can be successfully grafted with MAPP.
4. TEM micrograph shows that modified silicate layers are finely dispersed, some individually and some are stacked in thin layers.
5. In mechanical testing:

For the effect of filler content and clay content, the results show significant improvements on the elongation at break at low % filler and clay contents. We confirm that the effect of tie molecules produces good adhesion between the filler and PP matrix.

For the effect of M_w of PP matrix, the results show that the higher M_w polymer has better mechanical properties.

6. In slow crack growth testing:

PP nanocomposites require a longer time to initiate crack propagation relative to pure PP. The effect is more pronounced with a higher M_w polymer. This result illustrates the effect of tie molecules in the nanocomposites in delaying crack propagation.