CHAPTER V
CONCLUSIONS

Polymer nanocomposite of PEO/MMTs and PAMAM/MMTs can be used as adsorbent for wastewater treatment application. Physical behavior of the nanocomposites in aqueous solution was studied in term of particle size and specific viscosity of PEO/Na-MMT nanocomposites. It was found that the particle size was increase as clay content increase due to the presence of rigid plate-like structure of MMTs and the mobilization of Na^+ on the surface of clay caused the repulsion of negative charges of PEO and MMT. After addition of salts, the particle size tends to decrease due to the increase in coil density. However, specific viscosity tends to decrease as increase in clay content. This may be due to the alignment of nanocomposite particles under low shear rate condition of viscosity measurement. The ability of the nanocomposites to adsorb organic impurities can be improved by using organically modified montmorrillonite especially at 60 wt% MMTs of PEO/MMT nanocomposites the adsorption are improved from 38% to 98% for toluene and from 22% to 97% for xylene. The organoclay which were prepared by ion-exchange reaction using octadecylamine and di(hydrogenated tallow) dimethylammonium chloride have higher degree of basal spacing expansion than the unmodified form. Consequently, the probability of polymer to incorporate into the clay structure is higher and the organophillic site is created between the layer of clay. Moreover, incorporation of PAMAM dendrimer with organoclay has improvement in the ability to capture organic molecules due to highly branched structure with alkyl chain of PAMAM. The difference in ability to adsorb toluene and xylene molecules of PEO/MMTs and PAMAM/MMT nanocomposite is based on the molecular structure of both adsorbent and adsorbate.