CHAPTER V
CONCLUSIONS

In our, electrorheology properties of various elastomers were investigated in order to find the an electroactive material with a suitable response to electrical field . The elastomer with the best response was mixed with polypyrrole powder which was synthesized via the oxidative polymerization by using ammonium persulfate (APS) as an oxidant. The effect of matrix type in the absence electric field (G'_0) and the effect of particle concentration with and without electric field on the dynamic moduli, G' and G", under the oscillatory shear mode at electric field strength varying from 0 to 2 kV/mm were investigated. For pure elastomers, the storage modulus (G') monotonically increased with increasing electric field strength. We associate this finding with the increase in the number of electrical strands created by electric field. The AR70 elastomer appeared to have the largest storage modulus sensitivity under electric field because of the AR70 elastomer possesses a balance between the fluid and solid-like behavior, and the chemical structure of acrylate copolymer contains the carboxylate side group which can be more susceptible towards induced dipole moment.

For the effect of poly(pyrrole) particle concentration on the polymer blends with the concentrations of 0, 1, 2, 3, 4, and 5, G'_o increased linearly with particle concentration; polypyrrole particles within the matrix acted as effective fillers. In the presence of electric field, the particle-particle dipole interaction operated and dominated at relatively high concentrations. At low concentration, the presence of Ppy particles appeared to obstruct the number of electrical strands that can be generated.