

CHAPTER V

CONCLUSIONS

Poly(p-phenylene) was chemically synthesized by means of oxidative polymerization and subsequently doped by using FeCl_3 -ethanol solution in the ratio of dopant per monomer equal to 50:1. The dPPP shows no response to CO and H_2 but shows negative response to NH_3 . The electrical conductivity sensitivity of 50:1 dPPP toward NH_3 increase with increasing NH_3 concentration and can be then improved by introducing ZSM-5 zeolite into dPPP matrix. The sensitivity increases with zeolite content increases up to 30%. Beyond this fraction the sensitivity of the sensor decreases. The effect of cation type was then investigated, including Na^+ , K^+ , NH_4^+ and H^+ . The sensitivity of the composite with different cation containing in zeolite were arranged; 50:1dPPP(90)/KZ23 < 50:1dPPP < 50:1dPPP(90)/NaZ23 < 50:1dPPP(90)/ NH_4 Z23 < 50:1dPPP(90)/HZ23. The sensitivity increase with changing cation type can be described in term of acidic properties. The 50:1dPPP(90)/HZ23 possessed highest sensitivity of -0.36 due to H^+ has highest acidity which induces more favorable NH_3 adsorption and interaction with the conductive polymer.