CHAPTER V
CONCLUSIONS AND RECOMMENDATIONS

Highly conductive carbon was successfully prepared by pyrolysis process under inert atmosphere from polybenzoxazine xerogels. Polybenzoxazine xerogels were synthesized via sol-gel method which CTAB was used as soft template. Benzoxazine precursors composed of phenol, formaldehyde, and MDA. Then polybenzoxazines xerogels were pyrolysis in order to transform to carbon xerogels. Moreover, pyrolysis temperature was varied to study about the changing of carbon xerogels structure which effected to the electrical properties. Pyrolysis at 1000 °C shown the highest ordered structure and carbon started to transform from amorphous carbon to more crystalline carbon which most likely to graphene-like carbon structure because in such high temperature aromatic molecules had possibility to rearrange and localize themselves into higher order structure. Related to the results of the electrical conductivity, the highest electrical conductivity was 9808.736 S/cm which obtained from carbon xerogels that pyrolyzed at 1000 °C. As the result of conductivity, it was higher than general amorphous carbons. After the surface activation, the resulting carbons exhibited lower of the conductivity due to increasing of grain boundaries size and from oxygen containing groups that introduced to the carbon surface obstructed the electron transport.

In future work, raising of pyrolysis temperature and applying of pressure are required in order to change amorphous carbon to crystallite carbon like graphene because in many researches try to produce graphene from organic carbon precursors and used very high temperature and critical conditions. In this work, the highest temperature that was used just 1000 °C due to the limitation of instrument.