The effect of initiator amount, temperature and reaction time upon the synthesis proceeding has been studied. The increase of synthesis temperature decreases the molecular weight and double bonds content of oligomers and simultaneously increases the epoxy group content.

The increase of the oligomerization time results in the decrease of the epoxy number but leads to the growing of oligomer molecular weight.

Polydispersion of synthesized oligomers on the basis of isoprene is 1.9–2.1. In order to reduce polydispersion and increase the yield of oligomers with epoxy end-groups the polymerization of diene monomers has been carried out with continuous addition of initiator equal amounts to the mix. Obtained by such a way oligomers with epoxy groups are characterized by molecular weight ranges from 3500 to 5000.

TNT-BASED SULFONATED POLYNAPHTHYLIMIDES USEFUL AS PROTON EXCHANGE MEMBRANES FOR FUEL CELLS (PEMFCs)*

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PEMFC Fuel Cell uses a polymer membrane as an electrolyte. It is used in all applications with dynamic loads, especially in mobile applications but also as combined heat and power units in households. The development of the ion-conductivity of the membranes has much increased over the last 30 years. Today nafion-based membranes achieve a power density up to 1 W/cm² active area. In the last 10 years the successful adoption of the PEMFC in different prototypes could be demonstrated. For a market-introduction a few "teething problem" like life-time and costs have to be solved.

In this context scientists have high expectations in the development of high-temperature membranes. Cells with these temperatures can be operated over 100 °C.

In the frames of our investigations on the synthesis of aromatic condensation monomers and polymers based on 2,4,6-trinitrotoluene (TNT) we have developed new side-chain-sulfonated aromatic diamines (SCSADAs) polymers. Generally these diamines are prepared using multistep synthetic procedures; as a result they are expensive and unavailable. Our approach shows that the acidic groups on the pendant phenyl groups are more stable to hydrolysis than those with acidic groups directly attached to the main chains. Acidified polymers are stable up to 150 °C.