

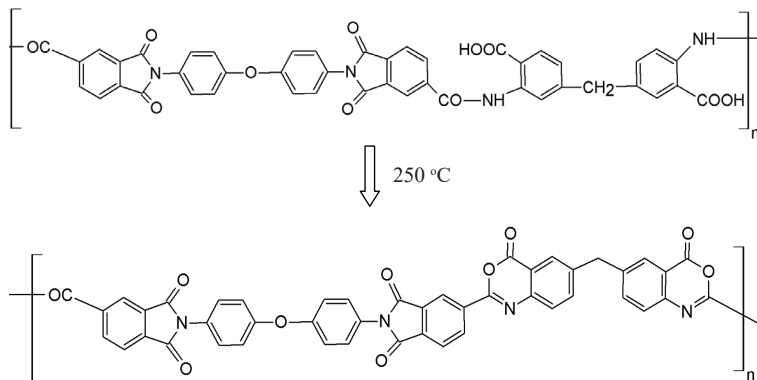
# Fabrication and characterization of novel membranes based on polybenzoxazinoneimide and its prepolymer

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Pervaporation has shown explicit advantages over conventional methods in case of the separation of mixtures with similar boiling point or azeotropic compositions, like enriching ethanol from biomass fermentation broth. The membrane material highly affects the separation performance. Polyimide membranes proved themselves to be an appropriate material exhibiting high mechanical and thermal resistance.

The objects of this study were polymers of heteroaromatic structure: polyamic acid imide-containing (PAAI) and polybenzoxazinoneimide (PBOI), which are the products of the same synthesis. The heat treatment of PAAI (250 °C) followed by dehydration and cyclization leads to the formation of polybenzoxazinoneimide (PBOI) which combines the valuable qualities of two polymer classes - polyimides and polybenzoxazinones (Fig. 1).



*Fig. 1. Thermal conversion of PAAI to PBOI.*

Complex research of membranes structure and transport behavior was performed. Pervaporation data demonstrates that PBOI membrane is much more efficient in separating water/ethanol mixture while PAAI is not promising for ethanol dehydration.

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