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COMB-TYPE METHYLSILOXANE POLYMERS: SYNTHESIS, PROPERTIES & APPLICATION

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The wide application of organosilicon polymers in many fields of techniques pushed the development of organosilicon chemistry and increased application-oriented researches in above mentioned field. Polysiloxanes are characterized by a number of interesting properties, e.g. excellent heat resistance, low toxicity, biocompatibility, high oxygen permeability, poor wet ability, extremely low surface tension, low melting point and glass transition temperature, resistance to radiation, special rheological properties, outstanding electrical isolating properties and others.

In this presented work we report the synthesis of new comb-type polysiloxane. Comb type polyorganosiloxanes may be synthesized by two ways:

1. Via hydrosilylation reaction of polymethylhydrosiloxane with allyl or vinyl containing compounds in the presence of platinum catalysts (Pt/C, platinum hydro-chloric acid, Karstedt's Catalyst, Rhodium and Ruthenium complexes); or using dehydrocoupling reactions of polymethylhydrosiloxane with hydroxyl containing compounds in the presence of catalysts.

2. The second way for synthesis of comb-type oligomers is the hydride addition of methylhydrocyclosiloxanes to allyl or vinyl containing compounds with ether, ester and trialkoxysilyl fragments, in the presence of platinum catalysts; obtaining of cyclotri(tetra, penta)siloxanes with various attached fragments and polymerization of methylorganocyclosiloxanes with terminated agent and without it.

Via sol-gel processes of some comb-type oligomers with lithium triflate and bis(trifluoromethylsulfonyl)imide (5-20%) solid polymer electrolyte membranes have been obtained. The dependence of ionic conductivity as a function of temperature and salt concentration has been studied.