

ABSTRACT

Transformation of bifunctional acetylenic monomers 1,3-diethynylbenzene and 1,4-diethynylbenzene was studied by means of coordination polymerization and copolymerization catalyzed with mononuclear Rh complexes of [Rh(dien)acac] type. These complexes were confirmed to catalyze the transformation of both monomers into high-molecular-weight polymer networks with the yield of about 50 %.

Pre-gelation stage of polymerization was monitored by SEC/PS and SEC/MALS techniques. Combination of these techniques allowed not only the molecular-weight characterization of reaction products but provided also information on the extent of polymer branching.

Resulting insoluble polymers were characterized by means of IR and DR UV/vis spectroscopies. Characterization revealed that polymers contained a significant amount of free ethynyl groups on the side phenyl substituents of non-branching monomeric units. These ethynyl groups were quantitatively transformed via thermal treatment in vacuo. The phenylene-butenyne-phenylene segments serving as additional linkers of polymer chains in the network are assumed as the product of the thermal treatment.