

Abstract

The following monoethynylated *N*-benzylidene-2-hydroxyanilines were prepared: *N*-(4-ethynylbenzylidene)-2-hydroxyaniline, *N*-(3-ethynylbenzylidene)-2-hydroxyaniline, *N*-(4-ethynylbenzylidene)-2-hydroxy-5-nitroaniline and *N*-(3-ethynylbenzylidene)-2-hydroxy-5-nitroaniline, which differed in the position of the ethynyl group on the benzylidene ring and the substitution of the hydroxyaniline ring. Monoethynylated *N*-benzylidene-2-hydroxyanilines were used as the monomers for the chain-growth coordination homo- and copolymerization. The homopolymerization resulted in linear polyacetylene homopolymers with *N*-benzylidene-2-hydroxyaniline substituents. The copolymerization with multiethynylarene-type cross-linkers provided densely cross-linked copolymeric polyacetylene networks. The linear units of the networks carried *N*-benzylidene-2-hydroxyaniline substituents, the interconnection between the chains of the networks being realized by arene links. The texture parameters of the prepared networks significantly depended on the type of comonomers used. The highest specific surface area values ($\sim 530 \text{ m}^2/\text{g}$) were achieved with networks prepared by copolymerization of *N*-(4-ethynylbenzylidene)-2-hydroxyaniline or *N*-(3-ethynylbenzylidene)-2-hydroxyaniline, with 4,4'-diethynylbiphenyl used as a cross-linker.

Selected linear polymers and polymer networks were metalated by Pd^{2+} ions, which were coordinated in the polymers to nitrogen and oxygen atoms of deprotonated *N*-benzylidene-2-hydroxyaniline substituents. The metalation of the linear homopolymer gave metalated homopolymer network of Pd content of 17,6 wt.%. Metalation of the copolymer networks resulted in metalated copolymer networks containing Pd up to 8,4 wt.%. The specific surface area of the metalated networks depended primarily on the specific surface area of the parent polymers used for metalation. The highest specific surface area value ($416 \text{ m}^2/\text{g}$) was obtained with a palladium metalated copolymer network prepared by copolymerization of *N*-(4-ethynylbenzylidene)-2-hydroxyaniline and 4,4'-diethynylbiphenyl. Organometallic polyacetylene networks prepared as part of the thesis will be further tested as heterogeneous catalysts at the cooperating workplace of ICT Prague.