

**SYNTHESIS OF POLYCONJUGATED COOLIGOMERS BASED ON THE
OXIDATIVE POLYCONDENSATION OF p-AMINOPHENOL AND 1-NAPHTHOL**

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Intensive research in the field of oxidative polycondensation of aromatic amines and phenols is directly related to the development of electrical conductivity of polyfunctional high-molecular compounds with polyconjugated linkages or antistatic polymer compositions. The creation of this type of polymer materials is associated with the high rate of development of the most advanced areas of modern technology, the need to use polymer materials for the purposeful solution of a wide variety of problems in these areas. Polymer compositions with high electrical conductivity are usually prepared by adding various metal powders, electrically conductive oligomers and polymers to polymers produced on an industrial scale (thermoplastics, elastomers and fibers).

Oxidation polycondensation reactions of phenols, aromatic amines, and naphthols are of interest in terms of the synthesis of high-molecular compounds containing both amine and hydroxyl groups and having a polyconjugated linkage system. These reactions usually use easily available monomers and oxidants. The range of applicable catalytic systems is wide and the yield of the target products as a result of the reaction is quite high. The obtained oligomers and polymers possess solubility and, in certain cases, melting ability, which facilitates their processing technology. In this regard, the oxidative polycondensation reaction of p-aminophenol with 1-naphthol is of particular interest. The reaction is carried out in the presence of hydrogen peroxide and as a result, high-molecular compounds with a polyconjugated linkage system and rich in functional groups are obtained. Such polymers can be applied as promising electrical conductive materials.

Table 1. Oxidation polycondensation reaction parameters of p-aminophenol with 1-naphthol in the presence of hydrogen peroxide

№	[p-Aph] mol	[1-Nph] mol	[H ₂ O ₂] mo/l	T, K	τ, hour	Oligomer yield
1	0.01	0.02	0.01	343	4	5.15
2	0.01	0.02	0.01	343	5	5.95
3	0.01	0.02	0.01	343	6	6.03
4	0.01	0.02	0.01	343	7	6.09
5	0.01	0.02	0.01	343	8	6.39

The oxidation polycondensation reaction of p-aminophenol with 1-naphthol in the presence of hydrogen peroxide at a temperature of 343 K was carried out at different time intervals. Other parameters in the process were kept constant, only the effect of the reaction time on the yield of the oligomer was studied. The results obtained show that in the first stage of the process (4–5 hours) a more noticeable increase in the yield is observed. In the subsequent stages, the growth rate decreases and the process enters a stage of relative stabilization. This indicates that the reaction proceeds more intensively in the initial stage, and over time, the increase in the molecular mass of the intermediate compounds leads to a weakening of the process speed due to the gradual consumption of the oxidant. Thus, at a temperature of 343 K and the indicated reagent concentrations, the optimal reaction time was determined to be in the range of 6–8 hours. The synthesized polyfunctional aromatic high-molecular compounds containing polyconjugated linkages are characterized by resistance to heat, plasma and radiation, tunable paramagnetic and electrical properties, as well as high activity in chemical reactions characteristic of the functional groups contained in the oligomers.