

Pembentukan radikal inisiator anorganik pada sintesis polianilin konduktif = Radical formation of inorganic initiators in conductive polyaniline synthesis

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Abstrak

ABSTRAK

Polianilin telah disintesis melalui polimerisasi oksidatif kimia dengan Ammonium Peroksidisulfat APS sebagai inisiator dalam berbagai konsentrasi 50 g/L, 100 g/L dan 200 g/L . Polimerisasi anilin berjalan dengan ditandai adanya kenaikan temperatur karena reaksi yang terjadi dalam larutan mencapai temperatur tertinggi sebesar 42 C pada larutan dengan konsentrasi APS 200 g/l. Hasil dari reaksi polimerisasi oksidatif berupa basa emeraldin PANi-EB . Struktur PANi dikonfirmasi dengan FTIR ditandai dengan adanya vibrasi stretching pada cincin benzenoid dan quinoid pada bilangan gelombang 1400-1500 cm⁻¹. Sifat konduktif PANi diperoleh melalui pemberian protonasi menggunakan asam kuat yaitu HCl dan HClO₄. Nilai konduktivitas PANi-EB mengalami peningkatan 102 kali setelah doping menggunakan HCl dan 106 kali pasca doping HClO₄. Semua PANi hasil sintesis memiliki kemampuan penyerapan gelombang elektromagnetik pada rentang frekuensi 10 GHz-15 GHz. Semakin tinggi nilai resistivitas PANi yaitu makin rendah nilai konduktivitas, semakin tinggi juga nilai reflection loss RL . Nilai RL tertinggi sekitar -18 dB pada frekuensi 12,5 GHz dan 14,3 GHz diperoleh dari PANi-EB hasil polimerasi dengan konsentrasi APS sebesar 200 g/l.

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ABSTRAK

Polianiline has been synthesized by chemical oxidative polymerization using Ammonium Peroxidisulfate APS as an initiator in various concentrations 50 g l, 100 g l and 200 g l . The polymerization reactions of aniline are characterized by an increase in temperature due to the reaction occurring in the solution, reaching the highest temperature of 42 C in a solution with APS concentration of 200 g l. Result of oxidative polymerization reaction is the emeraldine base polyaniline or PANi EB. The PANi formation was confirmed by FTIR which characterized by stretching vibrations in benzenoid and quinoid rings at wave numbers 1400 1500 cm⁻¹ respectively. The conductive property of PANi was obtained through doping by a protonation using strong acids HCl and HClO₄. It was found that conductivity value PANi EB increased 102 times after doping with HCl and 106 times after doping with HClO₄. Moreover, all synthesized PANi has the ability to absorb electromagnetic waves in the frequency range 10 GHz 15 GHz. The higher the resistivity value of PANi that is the lower the conductivity value, the higher the reflection loss RL . The highest RL values of about 18 dB at 12.5 GHz and 14.3 GHz frequencies were obtained from PANi EB polymeration results with APS concentrations of 200 g l.