

Calculation of copolymer (PSt-*g*-PTh) compositions from the ¹H NMR data

To calculate the extent of polystyrene and polythiophene chains in the graft copolymer the following method was adopted. The ratio of aliphatic hydrogens (a, b, c) to aromatic hydrogens (e, f, g) in the PSt-*co*-PAN, is $(0.961 \times 3) + (0.039 \times 2) : (0.961 \times 5) \sim 76.24 : 120.28$; after graft copolymerization of thiophene onto polystyrenic chains, this ratio changed to $(0.961 \times 3) + (0.039 \times 2) : (0.961 \times 5) + 2X \sim 93.16 : 285.36$, where X and 2 are the percent of polythiophene in the graft copolymer and number of its aromatic hydrogens in the polythiophene segments; 0.039 and 2 are the percent of PAN and number of its aliphatic hydrogens (except -CHCN) in the PSt-*co*-PAN part; 0.961, 3 and 5 are the percent of PSt and number of its aliphatic, and aromatic hydrogens in the PSt-*co*-PAN part, respectively. In Figure 5, by solving the equation, it can be seen that X=21.05%.