

E2-09 Covalent attachment of polyaniline on glass surfaces

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Polyaniline (PA) is a conducting polymer with enormous potential for industrial applications in electrochromic displays, batteries, information memories and liquid crystal display devices. Most of these potential applications, demand the processability of the material into thin films, sheets, rolls etc. Although PA can be solvent cast on to glass surfaces by dip coating (method 1) and spin coating (method 2) the films obtained are only weakly interacting with the substrate and hence peel off easily. In this paper a novel method (method 3) for the preparation of covalently attached polyaniline films on ordinary glass surfaces is presented. In the present work, glass surfaces were chemically modified and PA was synthesised on them by chemical polymerisation of aniline by $S_2O_8^{2-}$ from an aqueous solution. Thin films of polyaniline can be deposited on glass surfaces by all 3 methods. However, the films obtained by methods 1 & 2 peel off even on touching the plates. The films obtained on chemically treated glass plates are resistant even to mechanical rubbing, indicating the presence of strong interactions between the glass surface and the polymer.

The IR spectra of chemically treated glass plates clearly show the presence of N-H stretching characteristic of associated aromatic amines while those of PA coated glass show the characteristic absorptions of the polymer. The conductivities of these plates are 2 to 3 order of magnitude greater than those prepared by methods 1 & 2 indicating the continuity of polymer coat on the former glass plates.