

## E1-09 : ELECTROCHROMIC PROPERTIES OF POLYANILINE AND ITS DERIVATIVES

*R M G Rajapakse, L P P Lankeshwara; Dept. of Chemistry, University of Peradeniya.*

Aniline can be polymerised to yield polyaniline by means of potentiostatic or galvanostatic control, from both aqueous and non-aqueous media containing a background electrolyte. Potentiostatic polymerisation requires at least +0.70 V with respect to a saturated calomel electrode (SCE) and the galvanostatic control has the advantage that the film of definite thickness can be produced by controlling the charge passed through the medium. In our typical experiments, 1.00 cm<sup>3</sup> of distilled aniline was dissolved in a 50.00 cm<sup>3</sup> volume of either aqueous or non-aqueous solution containing 0.100 mol dm<sup>-3</sup> of various background electrolytes and 0.70 V wrt SCE or 10  $\mu$ A cm<sup>-2</sup> over a 20 minutes was applied. The conductivity of the resulting polyaniline depends strongly on the conditions of preparation. Polyaniline films prepared from solutions of pH values greater than 3 cannot be made to possess conductivity but those prepared in strong acidic media (pH < 3) have potential dependent conductivity. These films can be switched reversibly from a conducting state to a nonconducting redox state by cycling the potential within the range of solvent limits. However, the application of a very high +ve potential (ca. > 0.8 V vs SCE) in the absence of the monomer results in the destruction of the polymer. The background electrolyte has a decisive effect on the conductivity of the material. The change in potential of polyaniline results in the change in colour, i.e polyaniline exhibits electrochromic properties. The colour of the polymer depends on various factors such as potential, pH, type of the background electrolyte. Among the various polymers studied, N- alkyl derivatives of polyaniline exhibit intense colours and fast switching time.