

Liquid selective electrodes for dextromethorphan hydrobromide based on a molecularly imprinted polymer in PVC matrix membrane

Authors: Ahmed, J.I., Abu-Dalo, M.A., Nassory, N.S

Abstract: Liquid and graphite coated electrodes of polymers imprinted with dextromethorphan hydrobromide (DM) were constructed using precipitation polymerization. The molecularly imprinted (MIP) and nonimprinted (NIP) polymers were synthesized using DM as a template, acrylic acid (AA) and 2-vinyl pyridine (VPY) as monomers, ethylene dimethacrylate (EDMA) as a cross-linker and benzoyl peroxide (BPO) as an initiator. The molecularly imprinted membranes and the non-imprinted membranes were prepared using dioctyl phthalate (DOP) and bis (2-ethylhexyl) sebacate (BEHS) as plasticizers in PVC matrix. The slopes and detection limits of the liquid electrodes ranged from 55.9 ? 58.3 mV/decade and 3.0×10^{-6} ? 6.0×10^{-5} M, respectively and their response time was about 1 minute. The Liquid electrodes were filled with 0.01 M DM solution and their response was stable in a pH range from 2.0 to 9.0 and with good selectivity for DM over several species. Graphite electrodes coated with MIP membrane of AA and DOP and AA and BEHS were prepared for DM determination. Graphite electrodes coated with MIP membrane of AA and DOP showed a near Nernstian response with slope of 52.4 mV/decade and a linear response for a concentration range of 5.0×10^{-7} to 1.0×10^{-2} M and a response time of around 1 minute. The most effective electrodes were used to determine the concentration of DM in cough syrups.