

## Potentiometric Determination of Moxifloxacin in Some Pharmaceutical Formulation Using PVC Membrane Sensors

**Authors :** M. M. Hefnawy, A. M. A. Homoda, M. A. Abounassif, A. M. Alanazia, A. Al-Majed, Gamal A. E. Mostafa

**Abstract :** PVC membrane sensors using different approach e.g. ion-pair, ionophore, and Schiff-base has been used as testing membrane sensor. Analytical applications of membrane sensors for direct measurement of variety of different ions in complex biological and environmental sample are reported. The most important step of such PVC membrane sensor is the sensing active material. The potentiometric sensors have some outstanding advantages including simple design, operation, wide linear dynamic range, relative fast response time, and rotational selectivity. The analytical applications of these techniques to pharmaceutical compounds in dosage forms are also discussed. The construction and electrochemical response characteristics of Poly (vinyl chloride) membrane sensors for moxifloxacin HCl (MOX) are described. The sensing membranes incorporate ion association complexes of moxifloxacin cation and sodium tetraphenyl borate (NaTPB) (sensor 1), phosphomolybdic acid (PMA) (sensor 2) or phosphotungstic acid (PTA) (sensor 3) as electroactive materials. The sensors display a fast, stable and near-Nernstian response over a relative wide moxifloxacin concentration range ( $1 \times 10^{-2}$ - $4.0 \times 10^{-6}$ ,  $1 \times 10^{-2}$ - $5.0 \times 10^{-6}$ ,  $1 \times 10^{-2}$ - $5.0 \times 10^{-6}$  M), with detection limits of  $3 \times 10^{-6}$ ,  $4 \times 10^{-6}$  and  $4.0 \times 10^{-6}$  M for sensor 1, 2 and 3, respectively over a pH range of 6.0-9.0. The sensors show good discrimination of moxifloxacin from several inorganic and organic compounds. The direct determination of 400  $\mu\text{g/ml}$  of moxifloxacin show an average recovery of 98.5, 99.1 and 98.6 % and a mean relative standard deviation of 1.8, 1.6 and 1.8% for sensors 1, 2, and 3 respectively. The proposed sensors have been applied for direct determination of moxifloxacin in some pharmaceutical preparations. The results obtained by determination of moxifloxacin in tablets using the proposed sensors are comparable favorably with those obtained using the US Pharmacopeia method. The sensors have been used as indicator electrodes for potentiometric titration of moxifloxacin.

**Keywords :** potentiometry, PVC, membrane sensors, ion-pair, ionophore, schiff-base, moxifloxacin HCl, sodium tetraphenyl borate, phosphomolybdic acid, phosphotungstic acid

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