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Calibration free solid contact electrodes with two PVC based membranes

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Highlights

- solid contact ion selective electrodes with two layered PVC membranes
- characterized by stable standard potential, good slope reproducibility and high readouts stability
- meet parameters characteristic of the so-called „calibration free" electrodes

Abstract

A new type of solid contact ion-selective electrodes (ISEs) with two PVC-based sandwiched membranes are described. The first membrane contains suspension of halogen salts of silver and alkaline metals as well as silver nanoparticles and is placed on Ag substrate or conducting substrate covered with silver. It acts as a solid contact of an ion-selective electrode when covered with the second PVC membrane sensitive to potassium, sodium or chloride ions. In this way, the potassium, sodium and chloride electrodes characterized by very stable and reproducible standard potentials and slope were obtained. For example, all tested potassium electrodes with KBr/AgBr based solid contact exhibited E^0 values equal to: -191.2 ± 1.7 mV and the slope values equal to: -57.1 ± 0.8 mV/pK. Similarly, good results were also obtained for sodium and chloride ISEs. The solid contact offered allows to fabricate so-called „calibration free" ion-sensors.

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