

## The Influence of Plasticisers on Response Characteristics of Anionic Surfactant Potentiometric Sensor

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doi: 10.20964/2017.07.16

Received: 21 March 2017 / Accepted: 13 April 2017 / Published: 12 June 2017

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Six different plasticisers, 2-nitrophenyl octyl ether (P1), bis(2-ethylhexyl) phthalate (P2), bis (2-ethylhexyl) sebacate (P3), 2-nitrophenyl phenyl ether (P4), dibutyl phthalate (P5) and dibutyl sebacate (P6), were incorporated into PVC-based surfactant sensors, and their influence on the determination of anionic surfactants (sodium laurylsulfate (SDS) and sodium dodecylbenzenesulfonate (DBS)) was investigated. Dimethyldioctadecylammonium-tetraphenylborate (DDA-TPB) was used as an ion-pair in the membrane. The sensors containing plasticisers P1– P5 exhibited a sub-Nernstian slope value ranging from  $-46.4$  to  $-54.8$  (mV/decade of activity), while P6 exhibited a super-Nernstian slope value of  $-66.3$  (mV/decade of activity). All the obtained titration curves displayed well defined and sharp inflexion points. Due to the best analytical performance and its low price, the sensor containing dibutyl phthalate (P5) was selected for further investigation. It also provides fast dynamic response and the highest value of potential change at the end-point, allowing reliable end-point location even at low concentration levels of analyte. The linear response range of the sensor was  $6.1 \times 10^{-3}$  to  $7.2 \times 10^{-7}$  M with the sub-Nernstian slope value of  $-53.1 \pm 0.6$  (mV/decade of activity) and the lower detection limit of  $3.9 \times 10^{-7}$  M. The commonly used compounds in product formulations did not interfere with the measurements. Anionic surfactant content was successfully determined in commercial dishwashing detergents.

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**Keywords:** Plasticiser, surfactants, surfactant sensor, direct potentiometry, potentiometric titration

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