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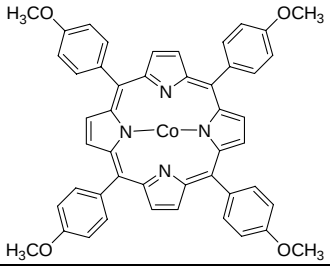
Arsenite



Arsenite ionophore I

(Molybdate ionophore I; 5,10,15,20-Tetrakis(4-methoxyphenyl)porphyrine cobalt(II) Complex; TMOPP-Co)

$C_{48}H_{36}CoN_4O_4$ M_r 791.76 [28903-71-1]

30236	**Selectophore®, function tested**	50 mg

Electrochemical Transduction

- **Ion-Selective Electrodes**

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Electrochemical Transduction

Ion-Selective Electrodes

Application and Sensor Type [1]

Method for the determination of arsenite by direct determination at pH 6.0-10.5.

Recommended Membrane Composition

1.6	wt%	Arsenite ionophore I (30236)
49.2	wt%	Dibutyl(butyl) phosphonate (DBBP) (38479)
49.2	wt%	Poly(vinyl chloride) high molecular weight (81392)

Equipment

- Electrode body ISE (45137)
- Reference electrode for ISE (16811)
- Glass plate (48952)
- Glass ring (48953)
- Punch for ISEs (63653)

Equilibration of Membranes and Potential measurements

Membranes were equilibrated by dipping them in 1.0 M AsO_2^- solution for 7 days. Potentials were measured by direct potentiometry at 25 ± 0.1°C with the help of provided reference electrode and the cell set up as reported. 1.0×10^{-1} M sodium arsenite was taken as inner reference solution.

Preparation of the membrane

The membranes incorporating ionophore (**I**) (Arsenite ionophore I) and plasticizer (DBBP) in definite composition in PVC matrix were fabricated by dissolving them in a minimum amount of THF. The solutions thus obtained, after complete dissolution of various components, were poured into glass ring placed on a smooth glass and allowed to evaporate at room temperature. After 24 hours, transparent membranes of 0.5 mm thickness were obtained which were then cut to size and attached to the provided electrode body.

Preparation and procedure

The membrane having composition 5:150:150 (**I**:PVC:DBBP) was prepared by the method as given above and dipped in 1.0 M AsO_2^- solution for 7 days. Potentials were recorded and plotted against the $-\log c_{AsO2}$.

Recommended Cell Assembly

Reference | | sample solution | | liquid membrane | 0.1 M $NaAsO_2$ | AgCl, Ag

Electrode Characteristics and Function

Selectivity coefficients $\log K^{Pot}_{AsO_2^-, X}$ as obtained by the separate solution method (0.01 M solutions of the sodium salts).

$\log K^{Pot}_{AsO_2^-, Cl^-}$	0.4	$\log K^{Pot}_{AsO_2^-, IO_3^-}$	0.1
$\log K^{Pot}_{AsO_2^-, NO_2^-}$	0.4	$\log K^{Pot}_{AsO_2^-, SCN^-}$	-0.7
$\log K^{Pot}_{AsO_2^-, NO_3^-}$	0.4	$\log K^{Pot}_{AsO_2^-, SO_4^{2-}}$	0.8

Slope of linear regression: -46.8 mV/dec ($7.9 \cdot 10^{-5}$ to $1.0 \cdot 10^{-1}$ M $NaAsO_2$)
Detection limit: $2.4 \cdot 10^{-5}$ M $NaAsO_2$

[1] V.K. Gupta, S. Agarwal, PVC based 5,10,15,20-tetrakis (4-methoxyphenyl) porphyrinatocobalt(II) membrane potentiometric sensor for arsenite. **Talanta *65***, 730 (2005).