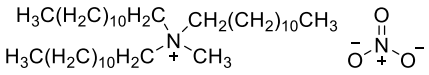
Product Information



91664 Tridodecylmethylammonium nitrate

(Methyltridodecylammonium nitrate; TDMA-NO_3)
Selectophore®, function tested

Electrochemical Transduction

Ion-Selective Electrodes

Application 1 and Sensor Type[1,2,3]

Assay of NO_3^- activity with solvent polymeric membrane electrode based on Tridodecylmethylammonium nitrate.

Recommended Membrane Composition

6.0 wt%	Tridodecylmethylammonium nitrate (91664)
65.0 wt%	2-Nitrophenyl octyl ether (NPOE) (73732)
29.0 wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended Cell Assembly

Reference || sample solution || liquid membrane | 0.01 M KNO_3 | AgCl, Ag

Electrode Characteristics and Function

Selectivity coefficients $\log K_{NO_3,X}^{Pot}$ as obtained by the separate solution method in (0.1 M solutions of the sodium salts, pH 8.4).

$\log K_{NO_3,ClO_4}^{Pot}$	3.0	$\log K_{NO_3,HCO_3}^{Pot}$	-3.1
$\log K_{NO_3,SCN}^{Pot}$	1.7	$\log K_{NO_3,SO_4}^{Pot}$	-3.2
$\log K_{NO_3,I}^{Pot}$	1.3	$\log K_{NO_3,OAc}^{Pot}$	-3.2
$\log K_{NO_3,Br}^{Pot}$	-0.7	$\log K_{NO_3,HPO_4}^{Pot}$	-3.4
$\log K_{NO_3,Cl}^{Pot}$	-2.1		

Slope of linear regression:	-60±0.9 mV/dec ($9\cdot10^{-5}$ to 10^{-1} M $NaNO_3$)
Detection limit:	$2\cdot10^{-5}$ M NO_3^-

Ion-Selective Field Effect Electrodes

Application 1 and Sensor Type[4]

Determination of NO_3^- with a new type of ion-selective field-effect transistor with polymer matrix membrane based on Tridodecylmethylammonium nitrate.

Recommended Membrane Composition

3.70 wt%	Tridodecylmethylammonium nitrate (91664)
64.20 wt%	2-Nitrophenyl octyl ether (NPOE) (73732)
32.10 wt%	Poly(vinyl chloride) high molecular weight (81392)

Electrode Characteristics

Selectivity coefficients $\log K^{Pot}_{NO_3,X}$ as obtained by the fixed interference method in (0.1 M K_2SO_4; 0.01 M NaCl).

$\log K^{Pot}_{NO_3,SO_4}$	-3.1
$\log K^{Pot}_{NO_3,Cl}$	-2.4

Detection limit:	$1.2 \cdot 10^{-4}$ M NO_3^-
Lowest limit of linear range:	$2.6 \cdot 10^{-4}$ M NO_3^-
Drift:	0.08 mV/h

Application 2 and Sensor Type[5]

Assay of NO_3^- activity with acrylate microsensor chips based on Tridodecylmethylammonium nitrate.

Recommended Membrane Composition

4.00 wt%	Tridodecylmethylammonium nitrate (91664)
19.90 wt%	2-Nitrophenyl octyl ether (NPOE) (73732)
47.70 wt%	Epoxyacrylate oligomer 600 (45351)
1.50 wt%	9,10-Phenanthrenequinone (156507)
26.90 wt%	1,6-Hexanediol dimethacrylate (411736)

Electrode Characteristics

Selectivity coefficients $\log K^{Pot}_{NO_3,X}$ as obtained by the fixed interference method in (0.1 M K_2SO_4; 0.01 M NaCl).

$\log K^{Pot}_{NO_3,SO_4}$	-3.6
$\log K^{Pot}_{NO_3,Cl}$	-1.5

Detection limit:	$2 \cdot 10^{-5}$ M NO_3^-
Slope of linear regression:	-52 mV
Lifetime:	>9 d

Optical Transduction

Application 1 and Sensor Type[6]

Determination of NO_3^- with a fluorescence-based fibre-optic chemical sensor by using a solvent polymer membrane based on Tridodecylmethylammonium nitrate. A high-intensity blue LED as exciting source and a photodiode as a detector were used.

Recommended Membrane Composition

2.10 wt%	Tridodecylmethylammonium nitrate (91664)
2.30 wt%	Chromoionophore XI (27102)
65.10 wt%	Bis(2-ethylhexyl) sebacate (84818)
30.50 wt%	Copolymer of vinyl chloride, vinyl acetate and vinyl alcohol (27827)

Sensor Characteristics

Measuring range:	10^{-5} to 10^{-2} M NO_3^- in buffered solutions, pH 6
Response time:	>1 min

[1] Anion-selective liquid membrane electrodes based on lipophilic quaternary ammonium compounds. D. Wegmann, H. Weiss, D. Ammann, W. E. Morf, E. Pretsch, K. Sugahara, W. Simon, Microchim. Acta. III, 1 (1984).
[2] Durable poly(vinyl chloride) matrix ion-selective field effect transistors for nitrate ions. S. Wakida et.al., Bunseki Kagaku 38, 510 (1989).
[3] V. Kratochvil, Cesk Hyg. 31, 355 (1986).
[4] Micromachined ion-selective electrodes with polymer matrix membranes. M. Knoll, K. Cammann, C. Dumschat, J. Eschold, C. Sundermeier, Sens. Actuators B21, 71 (1994).
[5] All-solid-state instrument for fluorescence-based fibre-optic chemical sensors. P. C. Hauser, S. S. S. Tan, Analyst 118, 991 (1993).