

Sodium

Sodium-selective Mini-Electrode		
71951		
Sodium Ionophore I		
	(ETH 227; N,N',N''-Triheptyl-N,N',N''-trimethyl-4,4',4''-propylidynetris(3-oxabutyramide))	
	$C_{36}H_{71}N_3O_6$ Mr = 641.97 [61183-76-4]	
71732	Selectophore®	
Sodium Ionophore II		
	(ETH 157; N,N'-Dibenzyl-N,N'-diphenyl-1,2-phenylenedioxydiacetamide)	
	$C_{36}H_{32}N_2O_4$ Mr = 556.64 [61595-77-5]	
71733	Selectophore®	
Sodium Ionophore III		
	(ETH 2120; N,N, N',N'-Tetracyclohexyl-1,2-phenylenedioxydiacetamide)	
	$C_{34}H_{52}N_2O_4$ Mr = 552.80 [81686-22-8]	
71734	Selectophore®	
Sodium Ionophore V		
	(ETH 4120; 4-Octadecanoyloxymethyl-N, N, N',N'-tetracyclohexyl-1,2-phenylenedioxydiacetamide)	
	$C_{53}H_{88}N_2O_6$ Mr = 849.29 [129880-73-5]	
71738	Selectophore®	
Sodium Ionophore VI		
	(Bis[(12-crown-4)methyl] dodecylmethylmalonate)	
	$C_{34}H_{62}O_{12}$ Mr = 662.87 [80403-59-4]	
71739	Selectophore®	
Sodium Ionophore X		
	(4-tert-Butylcalix[4]arene-tetraacetic acid tetraethylester)	
	$C_{60}H_{80}O_{12}$ Mr = 993.29 [97600-39-0]	
71747	Selectophore®	
Monensin decylester		
	(Decyl monensin)	
	$C_{46}H_{82}O_{11}$ Mr = 811.12	
69895	Selectophore®	

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Sodium Ionophore I - Cocktail A

Sodium-selective membrane solution for microelectrodes.

71176 Selectophore®

package with 0.1 ml

Sodium Ionophore II - Cocktail A

Sodium-selective membrane solution for microelectrodes.

71178 Selectophore®

Sodium-selective liquid ion-exchanger microelectrode Cocktail A

Sodium-selective membrane solution for microelectrodes.

71952 Selectophore®

Sodium-selective liquid ion-exchanger microelectrode Cocktail B

Sodium-selective membrane solution for microelectrodes.

71953 Selectophore®

liquid ion-exchanger microelectrode Cocktail C

Sodium-selective membrane solution for microelectrodes.

71949 Selectophore®

Sodium-selective

1. Electrochemical Transduction

1.1. Ion-selective Electrodes

Application 1 and Sensor Type

Assay of Na⁺ activity with Sodium-selective Mini-Electrode IonoSelect. For further information see page 17.

Application 2 and Sensor Type

Assay of Na⁺ activity in whole blood, plasma, serum, undiluted urine and aqueous solutions with solvent polymeric membrane electrodes based on Sodium Ionophore I.

Literature

[8, 12, 57, 58]

Recommended Cell Assembly

Reference | sample solution | liquid membrane | 0.1 M NaCl | AgCl, Ag

Recommended Membrane Composition

1.00	wt%	Sodium Ionophore I (ETH 227) (71732)
66.00	wt	Bis(1-butylpentyl) decane-1,10-diyl diglutarate (ETH 469) (30585)*
33.00	wt%	Poly(vinyl chloride) high molecular weight (81392)

* The use of bis(1-butylpentyl) adipate (BBPA) or bis(2-ethylhexyl)sebacate (DOS) leads to membrane electrodes of similar performance.

Electrode Characteristics and Function

Selectivity Coefficients log KPot.

	NaM	Required ¹⁾ for blood	urine	found
log KPot NaH	< 4.4	< 1.4	0.1	
log KPot NaK	< -0.6	< -2.1	-1.5	
log KPot NaMg	< -1.2	< -0.6	-3.2	
log KPot NaCa	< -1.3	< 0.6	-1.8	
Stability: Drift [mV h ⁻¹]:			0.03	
Standard deviation [mV]		< 0.12		0.12
Reproducibility [mV]				0.23
Lifetime: log PTLC2) ionophore	> 8.4	> 2.3	7.8	
log PTLC2) plasticizer	> 12.8	> 4.1	10.8	

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- 1) 1% interference, worst case (for details see [4, 28])
 2) lipophilicity, determined by thin layer chromatography (see [29])

Application 3 and Sensor Type

Assay of Na⁺ activity in blood with solvent polymeric membrane electrodes based on Sodium Ionophore II.

Literature
 [110]

Recommended Cell Assembly

Reference | | sample solution | | liquid membrane | 0.1 M NaCl | AgCl, Ag

Recommended Membrane Composition

1.00 wt% Sodium Ionophore II (ETH 157) (71733)
 66.00 wt Bis(1-butylpentyl) adipate (02150)
 33.00 wt% Poly(vinyl chloride) high molecular weight (81392)

Electrode Characteristics and Function

Selectivity Coefficients log KPot. as obtained by the separate solution method.

	NaM	Required ¹⁾ for blood	urine	found
log KPot. NaH	< 4.4	< 1.4		0.1
log KPot. NaNa	< -0.6	< -2.1		-1.5
log KPot. NaMg	< -1.2	< -0.6		-3.2
log KPot. NaCa	< -1.3	< 0.6		-1.8
Stability: Drift [mV h ⁻¹]:				0.03
Standard deviation [mV]	< 0.12			0.12
Reproducibility [mV]				0.23
Lifetime: log PTLC2) ionophore	> 8.4	> 2.3		7.8
log PTLC2) plasticizer	> 12.8		> 4.1	10.8

- 1) 1% interference, worst case (for details see [4, 28])
 2) lipophilicity, determined by thin layer chromatography (see [29])

Application 4 and Sensor Type

Assay of Na⁺ activity in whole blood, plasma, serum and aqueous solutions with solvent polymeric membrane electrodes based on Sodium Ionophore III.

Literature
 [62]

Recommended Membrane Composition

1.00 wt% Sodium Ionophore III (ETH 2120) (71734)
 66.00 wt Bis(1-butylpentyl) adipate (02150)
 33.00 wt% Poly(vinyl chloride) high molecular weight (81392)

Recommended Cell Assembly

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

Electrode Characteristics and Function

Selectivity Coefficients log KPot. as obtained by the separate solution method.

	NaM	Required ¹⁾ for blood	found
log KPot. NaH	< 4.4	-0.6	
log KPot. NaLi	< -0.13)	-1.2	
log KPot. NaK	< -0.6	-1.5	
log KPot. NaMg	< -1.2	-4.4	
log KPot. NaCa	< -1.3	-2.9	
Lifetime: log PTLC2) ionophore	> 8.4	8.3	
log PTLC2) plasticizer	> 12.8		9.3

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- 1) 1% interference, worst case (for details see [4, 28])
- 2) lipophilicity, determined by thin layer chromatography (see [29])
- 3) therapeutical Li⁺ concentrations

Application 5 and Sensor Type

Assay of Na⁺ activity with solvent polymeric membrane electrodes based on the highly lipophilic Sodium Ionophore V.

Literature

[147]

Recommended Membrane Composition

1.00	wt%	Sodium Ionophore V (71738)
0.06	wt%	Potassium tetrakis((4-chlorophenyl)borate (60591)
66.00	wt%	Bis(1-butylpentyl) adipate (02150)
33.00	wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended Cell Assembly

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

Electrode Characteristics and Function

Selectivity Coefficients log KPot. as obtained by the separate solution method (0.1 M solutions of the NaM chlorides).

log KPot. NaH	-0.6
log KPot. NaLi	-1.0
log KPot. NaK	-1.4
log KPot. NaMg	-3.8
log KPot. NaCa	-1.5

Slope of linear regression: 58.2 ± 1.1 mV (10⁻³ to 10⁻¹ M NaCl)

Detection limit: $2.5 \cdot 10^{-5}$ M Na⁺

Lifetime: log PTLC1 ionophore 17.2 ± 2.6

- 1) lipophilicity, determined by thin layer chromatography (see [29])

Application 6 and Sensor Type

Assay of Na⁺ activity with solvent polymeric membrane electrodes based on Sodium Ionophore VI.

Literature

[115, 168]

Recommended Membrane Composition

6.50	wt%	Sodium Ionophore VI (71739)
66.70	wt%	2-Nitrophenyl octyl ether (73732)
26.80	wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended Cell Assembly

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

Electrode Characteristics and Function

Selectivity Coefficients log KPot. as obtained by the mixed solution method.

log KPot. NaLi	-3.0
log KPot. NaK	-2.0
log KPot. NaNH ₄	-3.0
log KPot. NaMg	-3.7
log KPot. NaCa	-3.7

Slope of linear regression: 53 mV

Response time: 90% response time: < 5 min

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Application 7 and Sensor Type

Assay of Na⁺ activity with solvent polymeric membrane electrodes based on Sodium Ionophore X.

Literature

[329]

Recommended Membrane Composition

0.70	wt%	Sodium Ionophore X (71747)
0.20	wt%	Potassium tetrakis((4-chlorophenyl)borate (60591)
66.10	wt%	2-Nitrophenyl octyl ether (73732)
33.00	wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended Cell Assembly

Reference || sample solution || liquid membrane | 0.1 M NaCl | AgCl, Ag

Electrode Characteristics and Function

Selectivity Coefficients log KPot. as obtained by the separate solution method (0.1 M solutions of the NaM

chlorides).

log KPot.	-2.5
NaLi	
log KPot.	-1.9
NaK	
log KPot.	-1.6
NaCs	
log KPot.	-2.5
NaCa	
log KPot.	< -6
NaMg	

Slope of linear regression: 60 mV (10⁻⁴ to 10⁻¹ M Na⁺).

Detection limit: 3.5 · 10⁻⁶ M Na⁺.

Response time: t_∞ ≤ 20 s.

Application 8 and Sensor Type

Assay of Na⁺ activity solvent polymeric membrane electrodes based on Monensin decylester

Literature

[270]

Recommended Membrane Composition

3.00	wt%	Monensin decylester (69895)
1.00	wt%	Potassium tetrakis((4-chlorophenyl)borate (60591)
63.00	wt%	2- Nitrophenyl octyl ether (73732)
33.00	wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended Cell Assembly

Reference(outer electrolyte: 0.3 M NH₄NO₃) || sample solution || liquid membrane | 0.001 M NaCl | AgCl, Ag

Electrode Characteristics and Function

Selectivity Coefficients log KPot. as obtained by the separate solution method (0.1 M solutions of the NaM

chlorides).

log KPot.	-0.9
NaLi	
log KPot.	-0.8
NaK	
log KPot.	-2.1
NaMg	
log KPot.	-2.2
NaCs	
log KPot.	-2.6
NaBa	
log KPot.	-3.0
NaSr	
log KPot.	-3.5
NaCa	

Slope of linear regression: 59 mV (2 · 10⁻⁵ to 10⁻¹ M Na⁺).

For Monensin dodecylester similar results are reported [278, 279].

1.2. Microelectrodes

Application 1 and Sensor Type

Assay of Na⁺ activity in intracellular (single cell) liquids with Na⁺ microelectrodes based on Sodium Ionophore I.

Literature

General [39], application [40-56, 269]

Sodium Ionophore I - Cocktail A

Cocktail Composition

10.0	wt%	Sodium Ionophore I (ETH 227) (71732)
89.5	wt%	2-Nitrophenyl octyl ether (o-NPOE) (73732)
0.5	wt%	Sodium tetraphenylborate (72018)

Electrode Characteristics and Function

Selectivity Coefficients log KPot. as obtained by the separate solution method (0.1M solutions of the NaM chlorides) [39]:

log KPot.	- 0.4
NaLi	
log KPot.	- 0.2 (-2.3) see [39]
NaK	
log KPot.	- 2.4
NaMg	
log KPot.	- 0.2
NaCa	
log KPot.	- 1.8
NaAcetylcholine	

Slope of linear regression: 53.0±2.5 mV (20°C, 10⁻¹ to 10⁻³ M NaCl)

Detection limit (NaCl, intracellular ion background of 200 mM K⁺, 2.0 mM Mg²⁺, 0.01 mM Ca²⁺): log aNa ~-2.5

Electrical Resistance Tip diameter ~2 µm: ~1010 Ω

Response Time 90% response time: ≤ 5 s

Application 2 and Sensor Type

Assay of Na⁺ activity in extracellular liquids with Na⁺ microelectrodes based on Sodium Ionophore II.

Literature

General [59], application [22, 54, 61, 269]

Sodium Ionophore II - Cocktail A

Cocktail Composition

10.0	wt%	Sodium Ionophore II (ETH 157) (71733)
89.5	wt%	2-Nitrophenyl octyl ether (o-NPOE) (73732)
0.5	wt%	Sodium tetraphenylborate (72018)

Electrode Characteristics and Function

Selectivity Coefficients log KPot. as obtained by the separate solution method (0.1M solutions of the NaM chlorides) [59]:

log KPot.	- 1.7
NaLi	
log KPot.	- 0.4
NaK	
log KPot.	- 3.4
NaMg	
log KPot.	- 1.3
NaCa	
log KPot.	- 1.6
NaAcetylcholine	

Nernstian electrode response.

Detection limit (NaCl, extracellular ion background of 4 mM K⁺, 0.6 mM Mg²⁺, 1.1 mM Ca²⁺): log aNa ~-2.7

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Electrical Resistance Tip diameter $\sim 0.7 \mu\text{m}$: $\sim 3 \cdot 10^{10} \Omega$

Response Time 90% response time: $\leq 3 \text{ s}$

Application 3 and Sensor Type

Intracellular measurement of Na^+ activity with microelectrodes based on Sodium-selective liquid ion-exchanger microelectrode Cocktail A. The microelectrodes exhibits a low Na^+/K^+ -selectivity. Interference of K^+ should be taken in account.

Literature
[346, 347]

Sodium-selective liquid ion-exchanger microelectrode Cocktail A

Cocktail Composition

2.10 wt%	Potassium tetrakis(4-chlorophenyl) borate (60591)
12.10 wt%	Trioctylphosphine oxide (92848)
85.80 wt%	Tris (2-ethylhexyl) phosphate (93299)

Application 4 and Sensor Type

Intracellular measurement of Na^+ and K^+ activity with microelectrodes based on Sodium-selective liquid ion-exchanger microelectrode Cocktail B.

Literature
[347, 348]

Sodium-selective liquid ion-exchanger microelectrode Cocktail B

Cocktail Composition

1.50 wt%	Potassium tetrakis(4-chlorophenyl) borate (60591)
98.50 wt%	Tris (2-ethylhexyl) phosphate (93299)

Application 5 and Sensor Type

Intra- and extracellular measurement of Na^+ activity with microelectrodes based on Sodium-selective liquid ion-exchanger microelectrode Cocktail C.

Literature
[349- 352]

Sodium-selective liquid ion-exchanger microelectrode Cocktail C

Cocktail Composition

2.70 wt%	Potassium tetrakis(4-chlorophenyl) borate (60591)
10.00 wt%	Monensin
85.80 wt%	1,2-Dimethyl-3-nitrobenzene (40870)

Electrode Characteristics and Function

Selectivity Coefficients $\log K_{\text{Pot.}}^{\text{Na}}$ as obtained by the fixed interference method (1M of NaM

interfering ions.

$\log K_{\text{Pot.}}^{\text{NaK}}$	- 1.1
$\log K_{\text{Pot.}}^{\text{NaH}}$	- 1.1
$\log K_{\text{Pot.}}^{\text{NaMg}}$	- 0.8
$\log K_{\text{Pot.}}^{\text{NaCa}}$	- 2.2

Slope of linear regression: 58 mV (25 - 250 mM NaCl).

Practical measuring range: pH 5 - 9.

Response time: 90 % response time < 10 s.

Electrical resistance (tip diameter < 0.5 μm): $\sim 10^{10} \Omega$.

Detection limit (Na^+ -buffered solution, constant background of 200 mM K^+ , 2 mM Mg^{2+} , 0.01 mM Ca^{2+}): $\log a_{\text{Na}} \sim -2$

1.3. Ion-selective Field Effect Transistors

Application 1 and Sensor Type

Determination of sodium activity with a Na^+ -ion selective field-effect transistor (ISFET). The gate membrane is based on an "Urushi" matrix with good durability.

Literature

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[, 271, 272, 313, 327]

Cocktail Composition

5.00	wt%	Sodium Ionophore I (71732)
44.77	wt%	Bis(2-ethylhexyl) phthalate (80030)
0.23	wt%	Potassium tetrakis((4-chlorophenyl)borate (60591)
50.00	wt%	Urushi

Electrode Characteristics and Function

Selectivity Coefficients log KPot..

NaM

log KPot.	-1.5
NaK	
log KPot.	-1.6
NaNH ₄	
log KPot.	0.0
NaCa	
log KPot.	-2.4
NaMg	

Slope of linear regression: 53 mV (10⁻⁶ to 3 · 10⁻⁴ M Na⁺).

Application 2 and Sensor Type

Determination of sodium activity with ISFET based on Sodium Ionophore III incorporated in the gate membrane.

Literature

[271, 272, 324, 325]

Cocktail Composition

2.00	wt%	Sodium Ionophore III (71734)
65.00	wt%	Bis(2-ethylhexyl) sebacate (84818)
33.00	wt%	Poly(vinyl chloride) high molecular weight (81392)

The ISFET used contains a polyHEMA interlayer. The membrane solution (a total 100 mg of components in 1 ml THF) is cast on the polyHEMA layer.

Electrode Characteristics and Function

Selectivity Coefficients log KPot. (Fixed Interference Method with 0.1 M solutions for all salts.)

NaM

log KPot.	-1.6
NaK	
log KPot.	-2.6
NaCs	
log KPot.	-1.4
NaLi	
log KPot.	-2.2
NaRb	
log KPot.	-3.2
NaCa	
log KPot.	-3.6
NaMg	

Slope of linear regression: 58.4 - 61.6 mV (background of 0.1 M interfering ion).

1.4. Coated Wire Electrodes

Application 1 and Sensor Type

Determination of sodium activity with Coated Wire Electrode based on Sodium Ionophore VI.

Literature

[326, 328]

Cocktail Composition

3.20	wt%	Sodium Ionophore VI (71739)
64.30	wt%	2-Nitrophenyl octyl ether (73732)
32.50	wt%	Poly(vinyl chloride) high molecular weight (81392)

The components are dissolved in 3 ml THF to prepare the coating solution.

Electrode Characteristics and Function

Selectivity Coefficients log KPot. determined by the mixed solution method.

NaM

log KPot.	-2.0
NaK	

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log KPot.	-2.0
NaRb	
log KPot.	-1.5
NaCs	
log KPot.	-2.2
NaNH ₄	
log KPot.	-3.0
NaLi	
log KPot.	-4.0
NaCa	
log KPot.	-4.0
NaMg	
log KPot.	-4.0
NaSr	
log KPot.	-3.7
NaBa	

Slope of linear regression: 53 mV (10⁻¹ to 10⁻⁴ M Na⁺).

1.5. Other electrochemical Sensor Types

Application 1 and Sensor Type

Determination of Sodium-activity with disposable sodium sensor in double matrix membrane technology based on Sodium Ionophore II.

Literature
[323]

Cocktail Composition

1.00	wt%	Sodium Ionophore II (71733)
66.00	wt%	Bis(1-butylpentyl) adipate (02150)
33.00	wt%	Poly(vinyl chloride) high molecular weight (81392)

Electrode Characteristics and Function

Selectivity Coefficients log KPot. (Fixed Interference Method with 0.01 M solutions for Ca, Li, Mg and NaM

0.005 M solution for NH₄, K.)

log KPot.	-1.0
NaK	
log KPot.	-0.8
NaNH ₄	
log KPot.	-1.7
NaLi	
log KPot.	-2.9
NaCa	
log KPot.	-2.6
NaMg	

Slope of linear regression: 55.4 mV (10⁻⁰ to 3 · 10⁻⁴ M Na⁺).

Detection limit: 10⁻⁴ M NaCl.

Application 2 and Sensor Type

Determination of sodium activity with a All-Solid-State Electrode based on Sodium Ionophore X.

Literature
[330]

Cocktail Composition

0.70	wt%	Sodium Ionophore X (71747)
0.20	wt%	Potassium tetrakis((4-chlorophenyl)borate (60591)
66.10	wt%	2-Nitrophenyl octyl ether (73732)
33.00	wt%	Poly(vinyl chloride) high molecular weight (81392)

The sensor is a Pt/polypyrrole electrode coated with the PVC-Film.

Electrode Characteristics and Function

Selectivity Coefficients log KPot. determined by the separate solution method.
NaM

log KPot.	-2.7
NaK	
log KPot.	-3.4
NaCs	
log KPot.	-3.4
NaLi	

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Slope of linear regression: 58.7 mV (10⁻¹ to 10⁻⁴ M Na⁺).
 Detection limit: 10⁻⁵ M Na⁺.
 Response time: < 20 s.

2) Optical Transduction

Application 1 and Sensor Type

Assay of Na⁺ activity in aqueous solutions and diluted blood plasma with solvent polymeric optode membranes based on Chromoionophore II (ETH 2439) and Sodium Ionophore V (ETH 4120).

Literature

[151, 155, 218]

Recommended Membrane Composition

0.56	wt%	Chromoionophore II (ETH 2439)(27087)
12.04	wt%	Sodium Ionophore V (71738)
0.72	wt%	Sodium tetrakis[3,5-bis(trifluoromethyl)phenyl]borate (72017)
57.78	wt%	Bis(1-butylpentyl) adipate (02150)
28.89	wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended pH Buffer

0.05 M Magnesium acetate, adjusted to pH 4.9 with acetic acid for recording the calibration curve and for diluting blood plasma samples. (Available as ready-to-use solution (82624))

Absorbance Maxima of Chromoionophore II in Polymeric Optode Membranes [151]

$\lambda_{\text{deprot.}}^{\text{max}}$	$\lambda_{\text{prot.}}^{\text{max}}$
: 512 nm	: 656 nm

Optode Characteristics and Function

Selectivity Coefficients log K_{NaM}Opt. as obtained by the fixed interference method (0.01 M solution of the acetates, buffered to pH 5.5).

log K _{NaK} Opt.	-1.2
log K _{NaLi} Opt.	-1.1
log K _{NaCa} Opt.	-1.2
log K _{NaMg} Opt.	-2.5

Detection range: 10⁻¹ to 10⁻⁴ M NaCl (pH 4.9).

Application 2 and Sensor Type

Assay of Na⁺ activity in aqueous solutions with solvent polymeric optode membranes based on chromoionophore III (ETH 5350) and Sodium Ionophore V (ETH 4120).

Literature

[151, 155]

Recommended Membrane Composition

0.40	wt%	Chromoionophore III (ETH 5350) (27088)
12.06	wt%	Sodium Ionophore V (71738)
0.72	wt%	Sodium tetrakis[3,5-bis(trifluoromethyl)phenyl]borate (72017)
57.87	wt%	Bis(1-butylpentyl) adipate (02150)
28.94	wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended pH Buffer

0.1 M Tris(hydroxymethyl)aminomethane adjusted to pH 7.6 with HCl. (Available as ready-to-use solution (82626))

Absorbance Maxima of Chromoionophore II in Polymeric Optode Membranes [151]

$\lambda_{\text{deprot.}}^{\text{max}}$	$\lambda_{\text{prot.}}^{\text{max}}$
: 498 nm	: 645 nm

Optode Characteristics and Function

Selectivity Coefficients log K_{NaM}Opt. as obtained by the fixed interference method (0.01 M solution of the acetates, buffered to pH 5.5).

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log K _{Opt.} NaK	-1.2
log K _{Opt.} NaLi	-1.1
log K _{Opt.} NaCa	-1.4
log K _{Opt.} NaMg	-3.0

Detection range: 10^{-4} to 10^{-7} M NaCl (pH 7.6 (TRIS-buffer)).

Application 3 and Sensor Type

Assay of Na⁺ activity in aqueous solutions with solvent polymeric optode membranes based on Chromoionophore I (ETH 5294) and Sodium Ionophore X.

Literature [331]

Recommended Membrane Composition

0.47	wt%	Chromoionophore I (ETH 5294)(27086)
4.20	wt%	Sodium Ionophore X (71747)
1.45	wt%	Sodium tetraphenylborate (72018)
62.60	wt%	Bis(2-ethylhexyl) phthalate (80030)
31.30	wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended pH Buffer

0.1 M TRIS-HCl buffer.

Absorbance Maxima of Chromoionophore I in Polymeric Optode Membranes

$\lambda_{\text{deprot.}}^{\text{max}}$	$\lambda_{\text{prot.}}^{\text{max}}$
: 545 nm	: 660 nm, 614 nm

Optode Characteristics and Function

Selectivity Coefficients log K_{Opt.} as obtained by the separate solution method (TRIS-HCl buffer pH 8.0).

	NaH
log K _{Opt.} NaK	-2.1
log K _{Opt.} NaLi	-3.1
log K _{Opt.} NaCa	-2.3
log K _{Opt.} NaMg	-2.9

Detection range: $3 \cdot 10^{-2}$ to $3 \cdot 10^{-5}$ M NaCl (pH 9.0 (TRIS-buffer)).