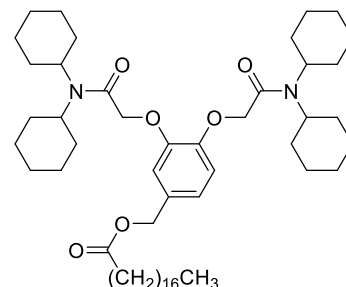


Product Information



71738 Sodium ionophore V

(ETH 4120; 4-Octadecanoyloxymethyl-*N,N,N',N'*-tetracyclohexyl-1,2-phenylenedioxydiacetamide)

Selectophore®, function tested

Electrochemical Transduction

Ion-Selective Electrodes

Application 1 and Sensor Type¹

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

Recommended Membrane Composition

- 1.00 wt% Sodium Ionophore V ([71738](#))
- 0.06 wt% Potassium tetrakis(4-chlorophenyl)borate ([60591](#))
- 65.96 wt% Bis(1-butylpentyl) adipate ([02150](#))
- 32.98 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 $\log K_{Na,M}^{Pot}$ as obtained by the separate solution method (0.1 M solutions of the chlorides).

$\log K_{Na,H}^{Pot}$	-0.6	$\log K_{Na,Mg}^{Pot}$	-3.8
$\log K_{Na,Li}^{Pot}$	-1.0	$\log K_{Na,Ca}^{Pot}$	-1.5
$\log K_{Na,K}^{Pot}$	-1.4		

Slope of linear regression: 57.9 mV/dec
 Detection limit: $2.5 \cdot 10^{-5}$ M Na⁺
 Lifetime: $\log P_{TLC}$ ionophore^{a)} 12.2±2.6

^{a)} lipophilicity, determined by thin-layer chromatography²



Optical Transduction

Application 1 and Sensor Type^{2,3,4}

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).

Recommended Membrane Composition

0.56 wt%	Chromoionophore II (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.

Absorbance Maxima of Chromoionophore II in Polymeric Optode Membranes²

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

Optode Characteristics and Function

Selectivity coefficients $\log K_{\text{Na},M}^{\text{Opt}}$ as obtained by the fixed interference method (0.01 M solutions of the acetates, buffered to pH 5.5).

$\log K_{\text{Na},K}^{\text{Opt}}$	-1.2	$\log K_{\text{Na},Ca}^{\text{Opt}}$	-1.2
$\log K_{\text{Na},Li}^{\text{Opt}}$	-1.1	$\log K_{\text{Na},Mg}^{\text{Opt}}$	-2.5

Detection range: 10^{-4} M to 10^{-1} NaCl (pH 4.9)

Application 2 and Sensor Type^{2,3}

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

Recommended Membrane Composition

0.40 wt%	Chromoionophore III (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.

Absorbance Maxima of Chromoionophore II in Polymeric Optode Membranes²

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

Optode Characteristics and Function

Selectivity coefficients $\log K_{\text{Na},M}^{\text{Opt}}$ as obtained by the fixed interference method (0.01 M solutions of the acetates, buffered to pH 5.5).

$\log K_{\text{Na},K}^{\text{Opt}}$	-1.2	$\log K_{\text{Na},Ca}^{\text{Opt}}$	-1.4
$\log K_{\text{Na},Li}^{\text{Opt}}$	-1.1	$\log K_{\text{Na},Mg}^{\text{Opt}}$	-3.0

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



¹ Very lipophilic sodium-selective ionophore for chemical sensors of high lifetime. P. Gehrig, B. Rusterholz, W. Simon, Anal. Chim. Acta 233, 295 (1990).

² K. Seiler, Ion-selective Optode Membranes, monograph, describing theory, preparation and application of ion-selective optode membranes as well as recent developments in this field. With 237 references. published by Fluka Chemie GmbH, Buchs, Switzerland (1993); Seiler, Ionenselektive Optodenmembranen, dt. Monographie, herausgegeben von Fluka Chemie GmbH, Buchs, Switzerland (1993).

³ Characterization of sodium-selective optode membranes based on neutral ionophores and assay of sodium in plasma K. Seiler, K. Wang, E. Bakker, W. E. Morf, B. Rusterholz, U. E. Spichiger, W. Simon, Clin. Chem. 37, 1350 (1991).

⁴ Optodes in clinical chemistry: potential and limitations. U. E. Spichiger, D. Freiner, E. Bakker, T. Rosatzin, W. Simon, Sens. Actuators B11, 263 (1993).



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