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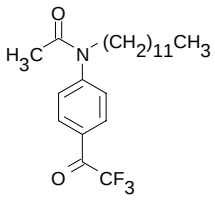
Alcohol

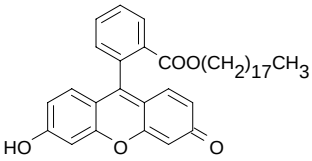


Carbonate ionophore III

(ETH 6022; *N*-Dodecyl-4-trifluoroacetylanilide)

$C_{22}H_{32}F_3NO_2$ M_r 399.49 [129476-45-5]

21854 **Selectophore®, function tested** 10 mg (solution in 0.5 mL THF)



Chromoionophore XI

(ETH 7061; Fluorescein octadecyl ester)

$C_{38}H_{48}O_5$ M_r 584.80 [138833-46-2]

27102 **Selectophore®** 50 mg

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Optical Transduction

Application 1 and Sensor Type [1,2]
Determination of 0.5 to 35% (v/v) ethanol in aqueous solution with an ethanol-sensitive solvent polymeric membrane based on Carbonate ionophore III.

Recommended Membrane Composition

3.00	wt%	Carbonate ionophore III (21854)
1.00	wt%	Tridodecylmethylammonium chloride (91661)
63.40	wt%	Bis(2-ethylhexyl) sebacate (84818)
32.60	wt%	Poly(vinyl chloride) high molecular weight (81392)

Absorbance Maxima of Carbonate ionophore III in the membrane

$\lambda_{max.}$: 305 nm

Optode Characteristics

Selectivity coefficients $\log K^{Opt}_{EtOH,\,j}$ as obtained by the fixed interference method.

$\log K^{Opt}_{EtOH,\,H_2O}$	-1.1	$\log K^{Opt}_{EtOH,\,iso\text{ - }Propanol}$	-0.9
$\log K^{Opt}_{EtOH,\,MeOH}$	0.2	$\log K^{Opt}_{EtOH,\,n\text{ - }Butanol}$	0.2
$\log K^{Opt}_{EtOH,\,n\text{ - }Propanol}$	-0.1	$\log K^{Opt}_{EtOH,\,tert\text{ - }Butanol}$	-1.1

Response time: < 30s
Lipophilicity: log P_{TLC} ionophore[1)] ~6.7

[1)] lipophilicity, determined by thin layer chromatography[3]

[1] K. Seiler, K. Wang, M. Kuratli, W. Simon, Development of an ethanol-selective optode membrane based on a reversible chemical recognition process. **Anal. Chim. Acta *244***, 151 (1991).
[2] U.E. Spichiger, M. Kuratli, W. Simon, ETH 6022: an artificial enzyme? A comparison between enzymatic and chemical recognition for sensing ethanol. **Biosensors and Bioelectronics *7***, 715 (1992).
[3] O. Dinten, U.E. Spichiger, N. Chaniotakis, P. Gehrig, B. Rusterholz, W.E. Morf, W. Simon, Lifetime of neutral-carrier-based liquid membranes in aqueous samples and blood and the lipophilicity of membrane components, **Anal. Chem. *63***, *596* (1991).

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Application 2 and Sensor Type [4]

Determination of 10 to 60% (v/v) ethanol in aqueous solution with an ethanol-sensitive solvent polymeric membrane based on Chromoionophore XI (fluorescence measurement).

Recommended Membrane Composition

5.00	wt%	Chromoionophore XI (27102)
63.30	wt%	Bis(1-ethylhexyl) phthalate (80030)
31.60	wt%	Poly(vinyl chloride) high molecular weight (81392)

Fluorescence properties of Chromoionophore XI

$\lambda_{excitation}$: 463 nm $\lambda_{emission}$: 527 nm

Recommended pH Buffer

0.1 M potassium dihydrogen phosphate with 0.05 M sodium tetraborate, pH 7.4.

Optode Characteristics

Concentration of alcohols causing a 5% increase in fluorescence signal of the optode membrane, relative sensitivity (ethanol=1) and measuring range.

	conc. [v/v]	rel. sensitivity	measuring range [v/v]
Methanol	5.8%	0.7	15-80 %
Ethanol	4.2%	1.0	10-60 %
2-Propanol	2.5%	1.7	15-50 %
1-Propanol	1.5%	2.8	10-50 %
1-Butanol	0.5%	8.4	-

Response time (ethanol measurement): < 30s.

[4] H.H. Zeng, K.M. Wang, D. Li, R.Q. Yu, Development of an alcohol optode membrane based on fluorescence enhancement of fluorescein derivatives. **Talanta *41***, 969 (1994).