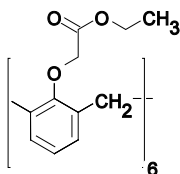


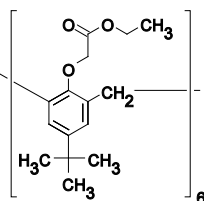
Cesium



Cesium ionophore I

(Calix[6]arene-hexaacetic acid hexaethylester)
C₆₆H₇₂O₁₈ M_r = 1153.27 [97600-45-8]

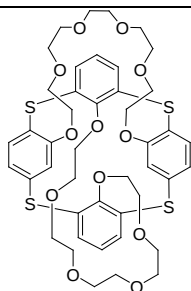
[21007](#) Selectophore®, function tested 50 mg



Cesium ionophore II

(4-*tert*-Butylcalix[6]arene-hexaacetic acid hexaethylester)
C₉₀H₁₂₀O₁₈ M_r = 1489.91 [92003-62-8]

[83757](#) Selectophore®, function tested 50 mg



Cesium ionophore III

(Thiacalix[4]-bis(crown-6))
C₄₄H₅₂O₁₂S₄ M_r = 901.14 [388569-88-8]

[01657](#) Selectophore®, function tested 50 mg

Electrochemical Transduction

- Ion-Selective Electrodes

Electrochemical Transduction

Ion-Selective Electrodes

Application 1 and Sensor Type ¹

Assay of Cs⁺ activity in aqueous solution with polymeric membrane electrodes based on Cesium ionophore I.

Recommended Membrane Composition

0.37	wt%	Cesium ionophore I (21007)
0.09	wt%	Potassium tetrakis(4-chlorophenyl) borate (60591)
66.36	wt%	2-Nitrophenyl octyl ether (73732)
33.18	wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended Cell Assembly

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

Electrode Characteristics and Function

Selectivity coefficients $\log K_{Cs, M}^{Pot}$ as obtained by the separate solution method for alkali metal ions (0.1 M solution of the chloride salts) or mixed solution method for alkaline earth metal ions (0.1 M) and the hydrogen ion (0.01 M)

$\log K_{Cs, Rb}^{Pot}$	-1.52	$\log K_{Cs, Ca}^{Pot}$	-3.97
$\log K_{Cs, K}^{Pot}$	-2.53	$\log K_{Cs, Mg}^{Pot}$	-3.92
$\log K_{Cs, Na}^{Pot}$	-3.73	$\log K_{Cs, H}^{Pot}$	-2.70
$\log K_{Cs, Li}^{Pot}$	-4.45	$\log K_{Cs, NH_4}^{Pot}$	-2.75

Slope of linear regression: 55.3 mV ($3 \cdot 10^{-5}$ to 10^{-1} M CsCl)

Detection limit $1 \cdot 10^{-5}$ M Cs⁺

Response time: few seconds

¹ A. Cadogan, D. Diamond, M.R. Smyth, G. Svehla, M.A. McKervey, E.M. Seward, S.J. Harris, Caesium-selective poly(vinyl chloride) membrane electrodes based on calix[6]arene esters. **Analyst** **115**, 1207 (1990).

Application 2 and Sensor Type ^{1,2}

Assay of Cs⁺ activity in aqueous solution with polymeric membrane electrodes based on Cesium ionophore II.

Recommended Membrane Composition

0.37	wt%	Cesium ionophore II (83757)
0.09	wt%	Potassium tetrakis(4-chlorophenyl) borate (60591)
66.36	wt%	2-Nitrophenyl octyl ether (73732)
33.18	wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended Cell Assembly

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

Electrode Characteristics and Function

Selectivity coefficients $\log K_{Cs, M}^{Pot}$ as obtained by the mixed solution fixed interference method for alkali metal ions (0.1 M solution of the chloride salts) or mixed solution method for alkaline earth metal ions (0.1 M) and the hydrogen ion (0.01 M)

$\log K_{Cs, Rb}^{Pot}$	-0.99	$\log K_{Cs, Ca}^{Pot}$	-3.52
$\log K_{Cs, K}^{Pot}$	-0.79	$\log K_{Cs, Mg}^{Pot}$	-3.02
$\log K_{Cs, Na}^{Pot}$	-2.05	$\log K_{Cs, H}^{Pot}$	-3.04
$\log K_{Cs, Li}^{Pot}$	-3.25	$\log K_{Cs, NH_4}^{Pot}$	-2.06

Slope of linear regression: >50 mV ($3 \cdot 10^{-5}$ to 10^{-1} M CsCl)

Detection limit $.1 \cdot 10^{-5}$ M Cs⁺

Response time: few seconds

² Katsu T, Ido K., Ethylammonium-selective membrane electrode using p-tert-butylcalix[6]arene derivatives. *Anal Sci.* **18**(4), 473 (2002).

Application 3 and Sensor Type ³

Determination of Cs⁺ activity in aqueous solution with polymeric membrane electrodes based on Cesium ionophore III. The electrode has a wide linear range and the selectivity for cesium ion over potassium ion ($\log K_{Cs,K}^{Pot} = -3.7$) is better than those previously reported with other ionophores.

Recommended Membrane Composition

1.000	wt%	Cesium ionophore III (01657)
65.863	wt%	Bis(2-ethylhexyl) sebacate (DOS) (84818)
0.137	wt%	Potassium tetrakis(4-chlorophenyl)borate (60591)
33.000	wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended Cell Assembly

Reference || sample solution || liquid membrane | 0.01 M CsNO₃ | AgCl, Ag

Electrode Characteristics and Function

Selectivity Coefficients $\log K_{Cs,M}^{Pot}$ as obtained by the fixed interference method (1 mM CsNO₃) at pH 7.4. ³

$\log K_{Cs,Rb}^{Pot}$	-1.4	$\log K_{Cs,NH_4}^{Pot}$	-2.5
$\log K_{Cs,K}^{Pot}$	-3.7	$\log K_{Cs,Ca}^{Pot}$	-5.5
$\log K_{Cs,Na}^{Pot}$	-4.3	$\log K_{Cs,Mg}^{Pot}$	-5.9

Slope of linear regression: 57.6 mV ($1 \cdot 10^{-6}$ to $3.2 \cdot 10^{-2}$ M CsNO₃)

pH range: 2.5-12.5

Response time: ca. 5s

³ Y. Choi, H. Kim, J.K. Lee, S.H. Lee, H.B. Lim, J.S. Kim, Cesium ion-selective electrodes based on 1,3-alternate thiocalix[4]biscrown-6,6. **Talanta** **64**, 975 (2004).