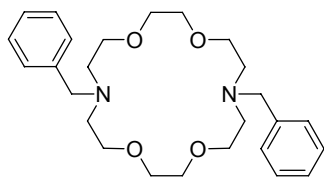
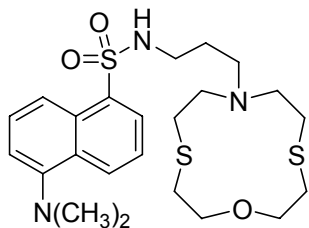


Mercury



Mercury ionophore I

(1,10-Dibenzyl-1,10-diaza-18-crown-6)

C₂₆H₃₈N₂O₄ M_r 442.59 [69703-25-9][39075](#) Selectophore® 50 mg, 250 mg

7-[3-(Dansylamido)propyl]-1-oxa-4,10-dithia-7-azacyclododecane

([12]aneNS₂O)C₂₃H₃₅N₃O₃S₃ M_r 442.59 [850870-28-9][90913](#) Selectophore® 25 mg

Electrochemical Transduction

Ion-Selective Electrodes

Application and Sensor Type ¹

Assay of Hg²⁺ activity in aqueous solution with solvent polymeric membrane electrode based on Mercury ionophore I.

Recommended Membrane Composition

4.5	wt%	Mercury ionophore I (39075)
37.9	wt%	Dibutyl butylphosphonate (38479)
0.8	wt%	Sodium tetraphenylborate (NaTPB) (72018)
56.8	wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended Cell Assembly

Reference || sample solution || liquid membrane | 0.1 M Hg(NO₃)₂ | AgCl, Ag

Electrode Characteristics and Function

Selectivity coefficients $\log K_{Hg, X}^{Pot}$ as obtained by the fixed interference method (10⁻² M of interfering ions). The membranes were dipped in a solution of 0.5 M Hg²⁺ for 3 days.

	With superscript	Without superscript
$\log K_{Hg, Na}^{Pot}$	0.23	-1.77
$\log K_{Hg, K}^{Pot}$	0.85	-1.55
$\log K_{Hg, NH_4}^{Pot}$	0.70	-1.30
$\log K_{Hg, Ag}^{Pot}$	1.28	-0.72
$\log K_{Hg, Ca}^{Pot}$	-1.47	-1.47
$\log K_{Hg, Sr}^{Pot}$	-1.51	-1.51
$\log K_{Hg, Cu}^{Pot}$	-1.72	-1.72
$\log K_{Hg, Ni}^{Pot}$	-1.51	-1.51
$\log K_{Hg, Cd}^{Pot}$	-1.20	-1.20
$\log K_{Hg, Co}^{Pot}$	-1.10	-1.10
$\log K_{Hg, Pb}^{Pot}$	-1.49	-1.50
$\log K_{Hg, Fe}^{Pot}$	-2.12	-2.46
$\log K_{Hg, Al}^{Pot}$	-2.28	-2.60
$\log K_{Hg, Cr}^{Pot}$	-2.52	-2.85

Slope of linear regression: 29.0±0.5 mV/dec (3.1·10⁻⁵ to 1.0·10⁻¹ M Hg²⁺)

Practical pH measuring range: 2.1-4.5

Response time: 15 s

Lifetime: 4 months

¹ V.K. Gupta, S. Chandra, S. Agarwal, Mercury selective electrochemical sensor based on a double armed crown ether as ionophore. **Indian Journal of Chemistry** **42A**, 813 (2003).

Optical Transduction

Fluorimetric Optical Sensor

Application and Sensor Type ²

Fluorometric bulk optode membrane based on 7-[3-(Dansylamido)propyl]-1-oxa-4,10-dithia-7-azacyclododecane for selective subnanomolar detection of Hg²⁺ ions.

Recommended Membrane Composition

- 3 wt% 7-[3-(Dansylamido)propyl]-1-oxa-4,10-dithia-7-azacyclododecane ([73732](#))
- 61 wt% 2-Nitrophenyl octyl ether (NPOE) ([73732](#))
- 1 wt% Potassium tetrakis(4-chlorophenyl)borate (KTPCIPB) ([60591](#))
- 35 wt% Poly(vinyl chloride) high molecular weight ([81392](#))

Characteristics:

Analyte	Indicator	Additive	Polymer matrix	Sensitive range (analyte in buffer pH 3.3)	LOD	λ_{ex} [nm]	λ_{em} [nm]	Response time
Hg ²⁺	[12]aneNS ₂ O	KTPCIB	PVC/NPOE	1.0×10 ⁻⁴ to 5.0×10 ⁻¹² M	8.0×10 ⁻¹³ M	409.7 338 in MeOH	523.3 495 in MeOH	<60s

² M. Shamsipur, M. Hosseini, K. Alizadeh, N. Alizadeh, A. Yari, C. Caltagirone, V. Lippolis, Novel fluorimetric bulk optode membrane based on a dansylamidopropyl pendant arm derivative of 1-aza-4,10-dithia-7-oxacyclododecane ([12]aneNS₂O) for selective subnanomolar detection of Hg(II) ions. **Anal. Chim. Acta** **553**, 17-24 (2005).