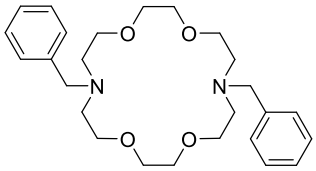
Product Information



39075 Mercury ionophore I

(Thallium ionophore I; 1,10-Dibenzyl-1,10-diaza-18-crown-6)
Selectophore®, function tested

Electrochemical Transduction

Ion-Selective Electrodes

Application 1 and Sensor Type[1]

Assay of Hg^{2+} 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 $Hg(NO_3)_2$ | AgCl, Ag

Electrode Characteristics and Function

Selectivity coefficients $\log K_{Hg,M}^{Pot}$ as obtained by the fixed interference method at (10^{-2} M of interfering ions). The membranes were dipped in a solution of 0.5 M Hg^{2+} 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±0.5 mV/dec ($3.1 \cdot 10^{-5}$ to $1.0 \cdot 10^{-1}$ M Hg^{2+})
Practical pH measuring range:	2.1-4.5
Response time:	15 s
Lifetime:	4 months

Application 2 and Sensor Type[2]

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

Recommended Membrane Composition

3.2 wt%	Thallium ionophore I (39075)
64.0 wt%	2-Nitrophenyl octyl ether (73732)
0.8 wt%	Sodium tetraphenylborate (NaTPB) (72018)
32.0 wt%	Poly(vinyl chloride) high molecular weight (81392)

Recommended Cell Assembly

Reference || sample solution || liquid membrane | 0.1 M $TlNO_3$ | AgCl, Ag

Electrode Characteristics and Function

Selectivity coefficients $\log K_{Tl,M}^{Pot}$ as obtained by the separate solution method at (0.1 M solutions of nitrate)
Optimum conditioning time for the membrane snsor in a 0.1 M $TlNO_3$ solution is 24 h.

$\log K_{Tl,H}^{Pot}$	-2.12	$\log K_{Tl,Ba}^{Pot}$	-2.66
$\log K_{Tl,Li}^{Pot}$	-2.08	$\log K_{Tl,Fe}^{Pot}$	-2.37
$\log K_{Tl,Na}^{Pot}$	-3.10	$\log K_{Tl,Co}^{Pot}$	-1.11
$\log K_{Tl,K}^{Pot}$	-1.31	$\log K_{Tl,Ni}^{Pot}$	-2.54
$\log K_{Tl,Cs}^{Pot}$	-2.20	$\log K_{Tl,Cu}^{Pot}$	-2.57
$\log K_{Tl,Ag}^{Pot}$	-1.36	$\log K_{Tl,Zn}^{Pot}$	-1.55
$\log K_{Tl,NH_4}^{Pot}$	-1.10	$\log K_{Tl,Cd}^{Pot}$	-0.92
$\log K_{Tl,Mg}^{Pot}$	-2.50	$\log K_{Tl,Hg}^{Pot}$	-0.08
$\log K_{Tl,Ca}^{Pot}$	-2.82	$\log K_{Tl,Pb}^{Pot}$	-3.34
$\log K_{Tl,Sr}^{Pot}$	-2.10		

Slope of linear regression**:**	56.9 mV/dec ($1.0 \cdot 10^{-5}$ to $1.0 \cdot 10^{-1}$ M $TlNO_3$)
Practical pH measuring range:	4.0-11.0
95% Response time:	10 s (10^{-2} M Tl^+)
Lifetime:	3 months

[1] Mercury selective electrochemical sensor based on a double armed crown ether as ionophore. V.K. Gupta, S. Chandra, S. Agarwal, Indian Journal of Chemistry 42A, 813 (2003).
[2] Thallium(I)-Selective Membrane Potentiometric Sensor Based on Dibenzyldiaza-18-crown-6. G. Khayatian, S. Shariati, A. Salimi, Bull. Korean. Chem. Soc. 24(4), 421 (2003).