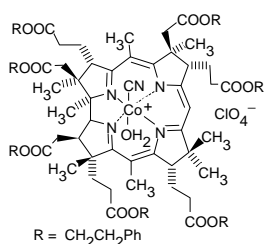


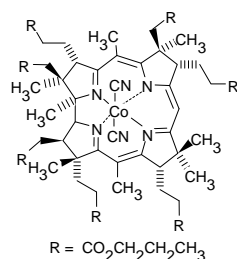
## Nitrite



### Nitrite ionophore I

(Aquo-cyano-cobyrinic acid-heptakis-(2-phenylethylester)  
 C<sub>102</sub>H<sub>117</sub>ClCoN<sub>5</sub>O<sub>19</sub> M<sub>r</sub> 1811.50 [130549-56-3]

[72590](#) **Selectophore<sup>®</sup>, function tested** 10 mg, 50 mg



### Nitrite ionophore II

(Dicyano-cobyrinic acid-heptapropylester)  
 C<sub>68</sub>H<sub>101</sub>CoN<sub>6</sub>O<sub>14</sub> M<sub>r</sub> 1285.51 [93441-85-1]

[72593](#) **Selectophore<sup>®</sup>, function tested** 50 mg solution in 0.5 mL tetrahydrofuran

## Electrochemical Transduction

- Ion-Selective Electrodes

**Fehler! Verweisquelle konnte nicht gefunden werden.**

## Electrochemical Transduction

### Ion-Selective Electrodes

#### Application 1 and Sensor Type <sup>1,2</sup>

Assay of NO<sub>2</sub><sup>-</sup> activity with solvent polymeric membrane electrode based on **Fehler! Verweisquelle konnte nicht gefunden werden..**

#### Recommended Membrane Composition

1.00	wt%	Nitrite ionophore I ( <a href="#">72590</a> )
0.30	wt%	Potassium tetrakis[3,5-bis(trifluoromethyl)phenyl] ( <a href="#">60588</a> )
65.70	wt%	2-Nitrophenyl octyl ether (NPOE) ( <a href="#">73732</a> )
33.00	wt%	Poly(vinyl chloride) high molecular weight ( <a href="#">81392</a> )

#### Recommended Cell Assembly

Reference || sample solution || liquid membrane | 0.01 M NaNO<sub>2</sub>, 0.01 M NaCl | AgCl, Ag

#### Electrode Characteristics and Function

Selectivity coefficients  $\log K_{NO_2^-, X}^{Pot}$  as obtained by the separate solution method (0.1 M solutions of the sodium salts, pH 7.4

(TRIS/H<sub>2</sub>SO<sub>4</sub>)

$\log K_{NO_2^-, SCN}^{Pot}$	0.2	$\log K_{NO_2^-, HCO_3}^{Pot}$	-3.7
$\log K_{NO_2^-, ClO_4}^{Pot}$	-2.4	$\log K_{NO_2^-, Cl}^{Pot}$	-3.7
$\log K_{NO_2^-, I}^{Pot}$	-2.2	$\log K_{NO_2^-, F}^{Pot}$	-3.7
$\log K_{NO_2^-, Br}^{Pot}$	-3.3	$\log K_{NO_2^-, Acetate}^{Pot}$	-3.8
$\log K_{NO_2^-, NO_3}^{Pot}$	-3.6	$\log K_{NO_2^-, SO_4}^{Pot}$	-4.1

Slope of linear regression: -58.0±0.6 mV/dec (10<sup>-5</sup> to 10<sup>-1</sup> M NaNO<sub>2</sub>)

Slope of linear regression after 60 days: -55.2 ± 1.6 mV (10<sup>-5</sup> to 10<sup>-1</sup> M NaNO<sub>2</sub>)

Detection limit: 5•10<sup>-6</sup> M NO<sub>2</sub><sup>-</sup>

Resistance: 0.81 ± 0.02 MΩ

#### Application 2 and Sensor Type <sup>3,4</sup>

Assay of NO<sub>2</sub><sup>-</sup> activity with solvent polymeric membrane electrode based on Nitrite ionophore II.

#### Recommended Membrane Composition

1.00	wt%	Nitrite ionophore II ( <a href="#">72593</a> )
66.00	wt%	Bis(2-ethylhexyl) sebacate ( <a href="#">84818</a> )
33.00	wt%	Poly(vinyl chloride) high molecular weight ( <a href="#">81392</a> )

#### Recommended Cell Assembly

Reference || sample solution || liquid membrane | 0.01 M NaNO<sub>2</sub>, 0.01 M NaCl | AgCl, Ag

<sup>1</sup> R. Stepanek, B. Kräutler, P. Schulthess, B. Lindemann, D. Ammann, W. Simon, Aquocyanocobalt(III)-hepta(2-phenylethyl)-cobyrinate as a cationic carrier for nitrite-selective liquid-membrane electrodes. **Anal. Chim. Acta** **182**, 83 (1986).

<sup>2</sup> U. Schaller, E. Bakker, U.E. Spichiger, E. Pretsch, Ionic additives for ion-selective electrodes based on electrically charged carriers. **Anal. Chem.** **66**, 391 (1994).

<sup>3</sup> S. Daunert, A. Witkowski, L.G. Bachas, Polymer Membrane-Based Biosensors Using Vitamin B12 Derivatives. **Prog. Clin. Biol. Res.** **292**, 215 (1989).

<sup>4</sup> S.A. O'Reilly, S. Daunert, L.G. Bachas, Nitrogen oxide gas sensor based on a nitrite-selective electrode. **Anal. Chem.** **63**, 1278 (1991).

#### Electrode Characteristics and Function

Selectivity coefficients  $\log K_{NO_2^-, X}^{Pot}$  as obtained by the matched potential method (0.10 M MES-NaOH, pH 6.6)

$\log K_{NO_2^-, \text{Salicylate}}^{Pot}$	0.6	$\log K_{NO_2^-, \text{Benzoate}}^{Pot}$	-3.0
$\log K_{NO_2^-, \text{SCN}}^{Pot}$	-0.4	$\log K_{NO_2^-, \text{Br}}^{Pot}$	-2.7
$\log K_{NO_2^-, \text{ClO}_4}^{Pot}$	-2.2	$\log K_{NO_2^-, \text{HCO}_3}^{Pot}$	-3.2
$\log K_{NO_2^-, \text{I}}^{Pot}$	-2.2	$\log K_{NO_2^-, \text{HPO}_4}^{Pot}$	-3.5

Slope of linear regression: -54.3 mV/dec  
 Detection limit:  $2 \cdot 10^{-5}$  M NaNO<sub>2</sub>

#### Application 3 and Sensor Type <sup>4</sup>

Assay of nitrogen oxide with a gas sensor based on Nitrite ionophore II with very good selectivity.

##### Recommended Membrane Composition

1.00	wt%	Nitrite ionophore II ( <a href="#">72593</a> )
66.00	wt%	Bis(2-ethylhexyl) sebacate ( <a href="#">84818</a> )
33.00	wt%	Poly(vinyl chloride) high molecular weight ( <a href="#">81392</a> )

##### Recommended Cell Assembly

Reference || internal solution buffered to pH 5.5 || liquid membrane | 0.01 M NaNO<sub>2</sub>, 0.01 M NaCl | AgCl, Ag

This electrode is placed behind a gas-permeable membrane. Gases can cross the membrane and are detected as nitrite in the internal buffer solution. The gases are generated in a solution of pH 1.7

#### Electrode Characteristics and Function

Selectivity coefficients  $\log K_{NO_2^-, X}^{Pot}$  as obtained by the matched potential method (0.10 M MES-NaOH, pH 5.5)

$\log K_{NO_2^-, \text{SCN}}^{Pot}$	-3.2	$\log K_{NO_2^-, \text{HCO}_3}^{Pot}$	< -4
$\log K_{NO_2^-, \text{Benzoate}}^{Pot}$	< -4	$\log K_{NO_2^-, \text{Cl}}^{Pot}$	< -4
$\log K_{NO_2^-, \text{Acetate}}^{Pot}$	< -4	$\log K_{NO_2^-, \text{NO}_3}^{Pot}$	< -4
$\log K_{NO_2^-, \text{Salicylate}}^{Pot}$	-2.4		

Slope of linear regression: -45 to -50 mV/dec  
 Response time: 5-15 min