

PVC**Dibenzo-18-Crown-6**

/ /

(NJC)**(2005/ 6 /22)****(2004/ 12 / 7)**

PVC DB18C6 (Pd²⁺)
 (Di-n-Octyl Phenyl Phthalate) (DOPP)

,
 / (1x10⁻³ - 1x10⁻⁶) (Pd (II))

(0.9998)

1.5 x 10⁻⁷ 2% RSD% 2% (26.7 mV/decade)

. /

,
 K_{ij}^{pot}

(25 sec) (11-7) pH

. (11) (30)

Abstract

A palladium (II) ion- selective electrode was prepared; depend on the active material DB18C6 as a sensor, deposited in PVC polymer, by use a (DOPP) as a plastizier substance, in the membrane.

The behavior and characteristics properties of this electrode have been studied.

It respond for the concentration range (1x10⁻⁶-1x10⁻³) mol/ L of palladium, with a relative standard error of about 2% and a relative standard deviation of 1-2 %.

The nernst linearity slop is equal to 26.7 mV/decade with detection limit of 1.5 x 10⁻⁷ mol/ L, and correlation coefficient of about (0.9998).

The selectivity coefficient K_{ij}^{pot} of it is electrode was calculated, in the presence of some interferences cations and anion with certain Pd (II) solutions.

It was found that range of pH response is (7-11), with response time of 25 sec. at 303 K, the electrode lifetime was found to be 11 days.

	(5)				
				Rechitz ⁽¹⁾	
		.ISEs			ISEs
				()	
Pd ²⁺				DB15C6, DB18C6, DB30C10,	
DB18C8				,	DC18C6
, DOPP		PVC			
				18C6	
					PVC 30C10
					K ⁺
					⁽²⁾ Na ⁺
(pH)	-1				Shpigum ⁽³⁾
(E mV)				Pb ²⁺	
pH-meter Knick-Digital England.				Diazo-	DB18C6
	-2			DCH18C6	Dithia-18C6 DB18C6
Calomel Reference Electrode, Gallinkamp, USA.				O-	PVC
	-3				nitrophenyloctylether
Silver-Silver chloride Electrode.				Diaza-	DB18C6 , Pb(NO ₃) ₂
	-4				Pb ²⁺ DB18C6
IE-Electrode , Orion Research-USA.					(29.2 mv/decade)
	-5			Dithia-18C6	,
Magnetic Stirrer, Gallinkamp England.					DCH18C6
	-6				,
Sensitive Balance, Sortoris, W.Germany.				PVC	Benzotetrathia-15C5
				, Dioctylphthalate	
				Cu ²⁺	
(Merck)				, Mg ²⁺ , Ni ²⁺ , Cd ²⁺	
		(Aldrich)			, Zn ²⁺
				(10 ⁻⁶ -10 ⁻²)	
	(1)				⁽⁴⁾ /

(1)

50/	/	
1.1520	0.1	Pd(NO ₃) ₂
1.0597	0.5	LiCl
1.4500	0.5	NaCl
1.8500	0.5	KCl
3.0200	0.5	RbCl
2.3500	0.5	MgCl ₂
2.7500	0.5	CaCl ₂
3.9250	0.5	SrCl ₂
5.1750	0.5	BaCl ₂
3.2000	0.5	NiCl ₂
3.3250	0.5	CuCl ₂
4.5500	0.5	CdCl ₂
4.0200	0.5	FeCl ₃
3.2975	0.5	AlCl ₃
3.3500	0.5	Na ₂ (COO) ₂
1.0450	0.5	NaF
3.0750	0.5	Na ₂ SO ₃
2.9725	0.5	NaHPO ₄
2.1000	0.5	NaHCO ₃
1.4500	0.5	NaCl
2.1250	0.5	NaNO ₃

(72)

(6-8)

() (12) (Mixed Method) 0.005
 () 0.003 (DB18C6)
 0.25 (DOPP)
 0.17 (PVC)
 (THF)
 (25) (8-7)
)
 (

Cork

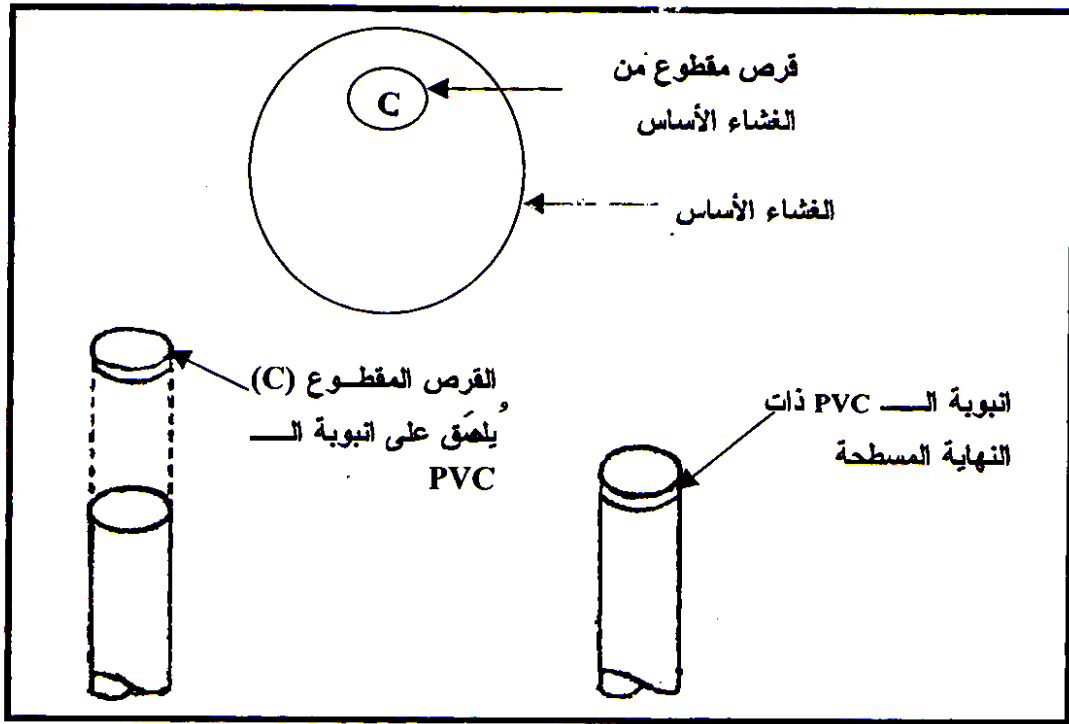
Borer . / (0.01)

PVC PVC

Ag/AgCl THF

PVC

(1) Disc

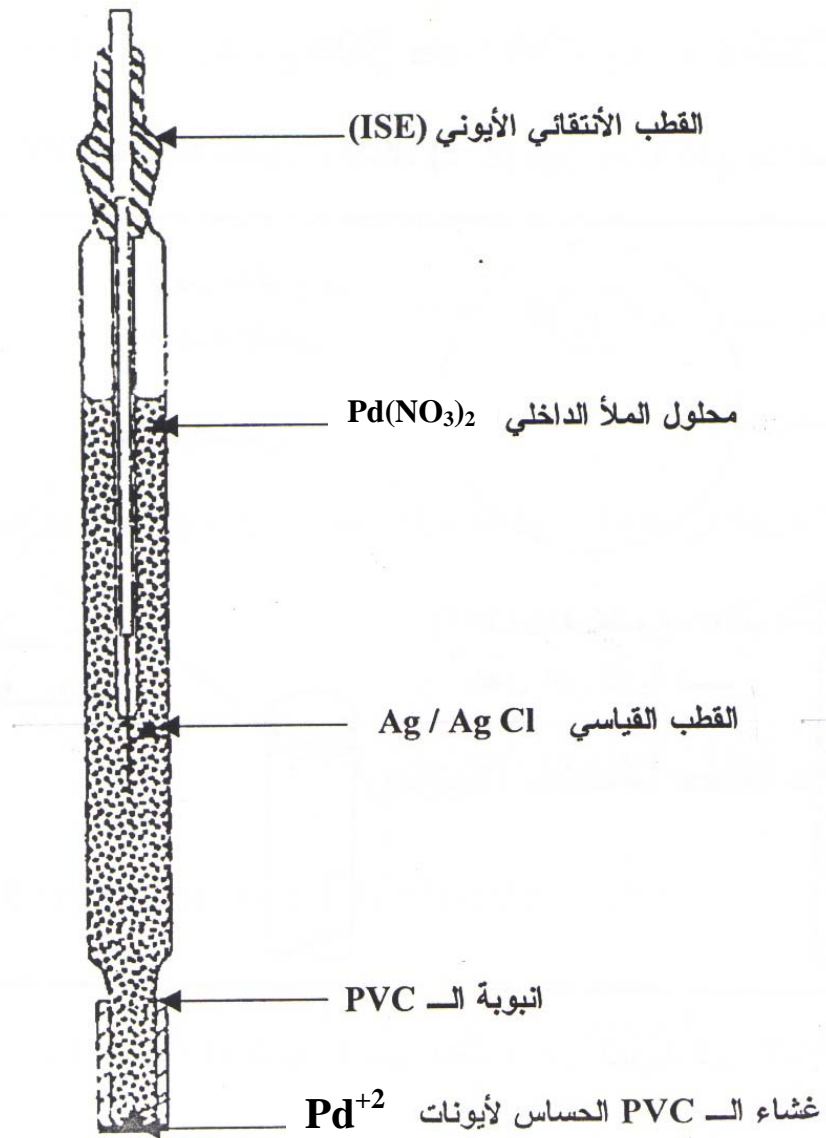


شكل (1) : طريقة تركيب الغشاء على أنبوبة الـ PVC

(2)

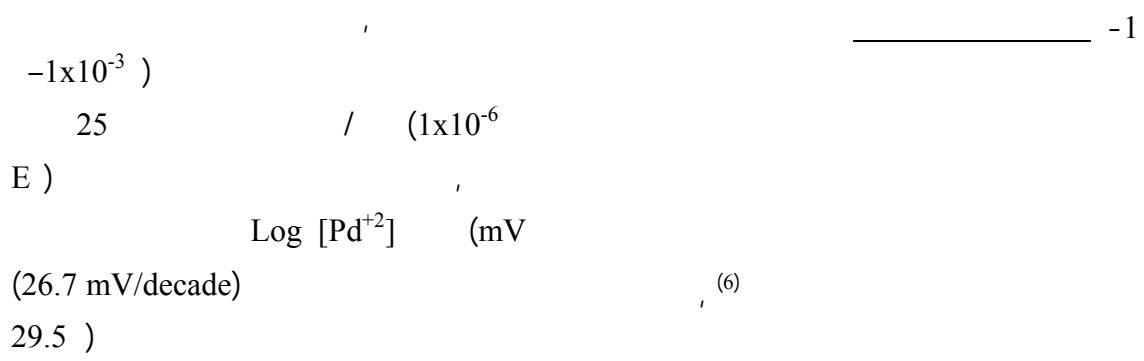
(9)

() / (0.01)

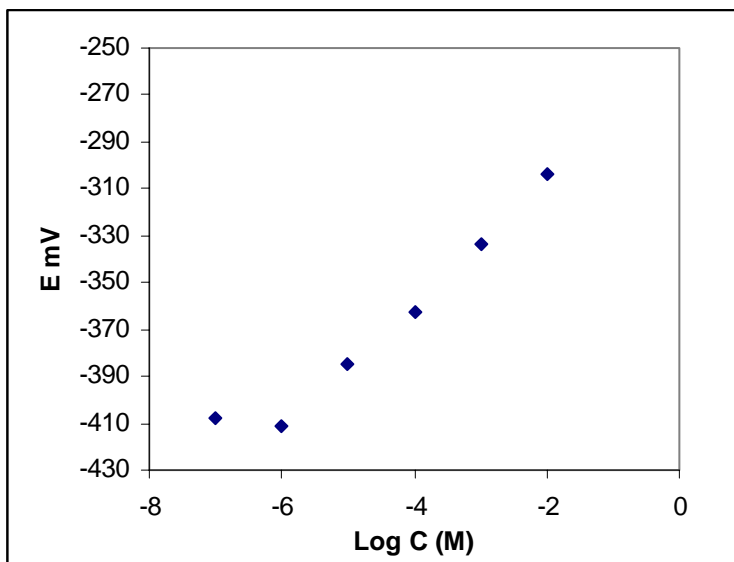


(Pd^{2+})

(2)



$$\begin{aligned}
 &) \quad \text{(mv/decade)} \\
 & \text{IUPAC} \quad / \quad (1.5 \times 10^{-7}) \\
 &) \\
 & (3) \quad (10) (\Delta E = 18/Z_i)
 \end{aligned}$$



(3)

mV/decade 26.7

1×10^{-3} ,)

/ (1×10^{-4})

$\text{Pd}(\text{NO}_3)_2$

_____ -2

/ $(1 \times 10^{-4} - 1 \times 10^{-2})$

$\text{Pd}(\text{NO}_3)_2$ (2)

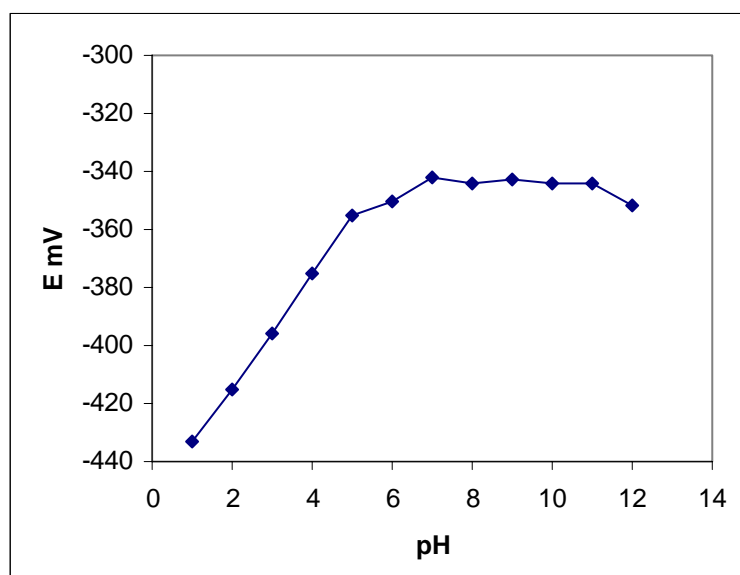
(2)

/ (1×10^{-2})

(2)

C mol/L	E mV		
	10^{-2}	10^{-3}	10^{-4}
10^{-2}	-304	-224	-251
10^{-3}	-334	-240	-242
10^{-4}	-363	-251	-239
10^{-5}	-385	-267	-228
10^{-6}	-411	-276	-224
10^{-7}	-388	-264	-206

(11-7) _____ -3
 (7) (11) pH (4) pH
 H₃O⁺ (11) pH
 (Pd⁺²) NaOH HCl
 (7) pH



(4)

(3)

(Pd⁺²)

Selectivity

-4

Coefficient

$$(i) \quad (a_i) \quad (j) \quad (3)$$

$$/ \quad (0.1)$$

$$, / \quad (1 \times 10^{-4}) \quad Pd^{2+}$$

$$K_{i,j}^{pot}$$

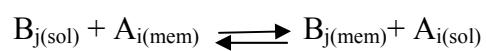
$$K_{i,j}^{pot}$$

$$(j) \quad (i)$$

$$, (Pd^{+2})$$

-:

$$. K_{i,j}^{pot} \quad (11)$$



$$K_{i,j}^{pot} = \frac{a_i \cdot 10^{(E_{i,j} - E_i) / s} \cdot a_i}{a_j^{z_i / z_j}}$$

A_i

B_j

$$. 1 > K_{A_i, B_j}^{pot}$$

(i)

(E_{i,j})

B_i

(j)

$$K_{A_i, B_j}^{pot}$$

(i)

(E_i)

(11)

$$(a_{B_j} / a_{A_i})$$

(j)

(j)

(i)

(a_i)

(j)

(a_j)

(i)

(3)

Ions	$K_{i,j}^{pot} \times 10^{-6}$
Li ⁺	-2.70
Na ⁺	-5.50
K ⁺	-2.70
Rb ⁺	-2.70
Mg ⁺²	-9.50
Ca ⁺²	-9.50
Sr ⁺²	-9.50
Ba ⁺²	-7.00
Ni ⁺²	-7.50
Cu ⁺²	-6.00
Cd ⁺²	-5.00
Fe ⁺³	-16.80
Al ⁺³	-17.80
(COO) ₂ ⁻²	-2.85
F ⁻	-9.99
SO ₃ ⁻²	-2.85
HPO ₄ ⁻	-9.99
HCO ₃ ⁻	-9.99
Cl ⁻	-9.99
NO ₃ ⁻	-9.99

(4)

,(Pd⁺²)

(4)

RE %	RSD %	I		
		(12)		
2.50	3.34	1.13 x10 ⁻³	1.42 x10 ⁻³	1.50 x10 ⁻³
1.98	2.01	1.80 x10 ⁻⁴	2.03 x10 ⁻⁴	2.3 x10 ⁻⁴

References

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