# Application Bulletin

Metrohm

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**Nr. 73/2 d,f,e**

## *Polarographische Analysen – Halbstufenpotentiale organischer Substanzen*
## *Analyses polarographiques – Potentiels de demi-vague de substances organiques*
## *Polarographic analysis – Half-wave potentials of organic substances*

Dieses Bulletin erweitert das Application Bulletin Nr. 36 (Halbstufenpotentiale anorganischer Substanzen) in dem Sinne, dass die Halbstufenpotentiale von 100 verschiedenen organischen Substanzen aufgeführt sind. Daneben finden sich die verwendeten Grundlösungen, sowie die Bestimmungsgrenzen.

Die Substanzen sind in alphabetischer Reihenfolge aufgeführt. Es wurden die wichtigsten, polarographisch aktiven, funktionellen Gruppen berücksichtigt. Somit können nicht aufgeführte, verwandte Substanzen in ähnlichen oder gleichen Grundlösungen polarographiert werden.

Die Halbstufenpotentiale beziehen sich, wenn nichts anderes angegeben ist, auf eine Temperatur von 20 °C (Spannung in Volt). Sie wurden gegen die KCl-gesättigte Silber Silberchloridelektrode gemessen.

Die Bestimmungsgrenze gibt an, bis zu welchem Minimalgehalt gearbeitet werden kann, ohne zu grosse Analysenfehler zu riskieren. Die Nachweisgrenze liegt in allen Fällen unter der Bestimmungsgrenze.

Ce bulletin complète l'information du Bulletin d'application No. 36 (Potentiels de demi-vague de substances inorganiques) par la mention des potentiels de demi-vague de 100 substances organiques différentes. La mention du potentiel est en outre accompagnée de l'indication des électrolytes porteurs utilisés ainsi que des limites de détermination.

Les substances sont citées par ordre alphabétique. Nous avons fait figurer dans ce bulletin les groupes fonctionnels polarographiquement actifs les plus importants. Il est par conséquent également possible de polarographier des substances apparantées ne figurant pas sur la liste dans des électrolytes porteurs identiques ou analogues.

Les potentiels de demi-vague (tension en volts) se rapportent, sauf mention contraire, à une température de 20 °C. Ils furent mesurés par référence à une électrode argent chlorure d'argent, saturée de KCl.

La limite de détermination indique jusqu'à quelle concentration minimale il est possible de procéder à l'analyse, sans risques d'obtenir de grandes erreurs d'analyse. La limite décelable est toujours inférieure à la limite de détermination.

# *Polarographische Analysen – Halbstufenpotentiale organischer Substanzen*
# *Analyses polarographiques – Potentiels de demi-vague de substances organiques*
# *Polarographic analysis – Half-wave potentials of organic substances*

This Bulletin is a supplement to Application Bulletin No. 36 (Half-wave potentials of inorganic substances) in the sense that the half-wave potentials of 100 different organic substances are listed. At the same time the supporting electrolytes used and the limits of determination are given.

The various substances are listed in alphabetical order. The most important polarographically active functional groups are taken into consideration. This means that substances for related structure can also be determined polarographically in the same or similar supporting electrolytes, although they may not appear in the list.

Unless otherwise stated, the half-wave potentials refer to a temperature of 20 °C, and the potentials are given in volts, measured with a sat. KCl-Ag/AgCl electrode assembly.

The determination limits give the smallest concentrations which can be measured without risking serious errors in the results. In all cases, the limit of detection lies below the limit of determination.

**Geräte – Appareillage – Apparatus**

Polarecord 506 mit Polarographierstand 663

Polarecord 506 avec Poste de polarographie 663

506 Polarecord with 663 Polarography Stand

**Literatur – Bibliographie – Literature**

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| Nr. | Substance | Formula | Molecular weight | Supporting solution | Half wave potential | Determination limit |
|---|---|---|---|---|---|---|
| 1 | Acetaldehyde | $C_2H_4O$ | 44.05 | LiOH 0.1 mol/L | –1.85 | $2.5 \cdot 10^{-4}$ mol/L |
| 2 | Acetanilide | $C_8H_9NO$ | 135.17 | LiCl 0.03 mol/L | –0.77 | $3 \cdot 10^{-6}$ mol/L |
| 3 | Acetic acid | $C_2H_4O_2$ | 60.05 | $(C_2H_5)_4NI$ 0.05 mol/L | –2.06 | $7 \cdot 10^{-6}$ mol/L |
| 4 | Acetone | $C_3H_6O$ | 58.08 | $NH_3$ / $(NH_4)_2SO_4$ 2.5 mol/L | –1.62 | $5 \cdot 10^{-4}$ mol/L |
| 5 | Acetophenone | $C_8H_8O$ | 120.15 | TBAOH 0.05 mol/L in 50% Isopropanol | –1.15 | $2 \cdot 10^{-6}$ mol/L |
| 6 | Acetyl salicylic acid | $C_9H_8O_4$ | 180.16 | LiCl 0.1 mol/L | –1.89 | $4.5 \cdot 10^{-6}$ mol/L |
| 7 | Acridine | $C_{13}H_9N$ | 179.21 | $NH_4NO_3$ saturated in benzene, methanol, benzine | –0.55 | $1.5 \cdot 10^{-4}$ mol/L |
| 8 | Alizarine | $C_{14}H_8O_4$ | 240.20 | Phosphate buffer pH 7.0 containing 1% ethanol | –0.57 | $8.3 \cdot 10^{-6}$ mol/L |
| 9 | Alloxan | $C_4H_2O_4N_2 \cdot H_2O$ | 160.03 | Phosphate buffer pH 7.0 | –1.02 | $5 \cdot 10^{-6}$ mol/L |
| 10 | Aniline | $C_6H_7N$ | 93.13 | HCl 0.1 mol/L 0 °C | –0.30/–0.80 | $1 \cdot 10^{-5}$ mol/L |
| 11 | Anthraquinone | $C_{14}H_8O_2$ | 208.22 | $NH_4NO_3$ saturated in benzene, benzine, methanol | –0.45 | $1 \cdot 10^{-4}$ mol/L |
| 12 | Anthrone | $C_{14}H_{10}O$ | 194.24 | Buffer pH 7.0, 40% dioxane | –1.41 | $2.1 \cdot 10^{-5}$ mol/L |
| 13 | Atropine sulfate | $(C_{17}H_{23}NO_3)_2 \cdot H_2SO_4 \cdot H_2O$ | 694.85 | KOH 10% | –0.69 | $6 \cdot 10^{-6}$ mol/L |
| 14 | Benzalacetone | $C_{10}H_{10}O$ | 146.19 | 0.1 mol/L $NH_4Cl$ | –1.06 | $1.4 \cdot 10^{-5}$ mol/L |
| 15 | Benzaldehyde | $C_7H_6O$ | 106.12 | Buffer pH 7.0 50% ethanol | –1.50 | $2.5 \cdot 10^{-5}$ mol/L |
| 16 | Benzidine | $C_{12}H_{12}N_2$ | 184.24 | Borate buffer pH 9.0 | –1.20/–1.40 | $2.2 \cdot 10^{-5}$ mol/L |
| 17 | Benzophenone | $C_{13}H_{10}O$ | 182.22 | Buffer pH 7.0 / 0.1 mol/L KCl / 25% ethanol | –1.35 | $1.4 \cdot 10^{-5}$ mol/L |
| 18 | Bilirubin | $C_{33}H_{36}N_4O_6$ | 584.68 | Borate buffer pH 9.0 | –1.50 | $7 \cdot 10^{-6}$ mol/L |
| 19 | Brucine | $C_{23}H_{26}N_2O_4 \cdot 4H_2O$ | 466.54 | Borate buffer pH 9.0 with HCl at 8.0 | –1.94 | $4.3 \cdot 10^{-6}$ mol/L |
| 20 | Carbon tetrachloride | $CCl_4$ | 153.84 | $(CH_3)_4NBr$ 0.1 mol/L in methanol 1:2, 0-5 °C | –1.06 | $2.6 \cdot 10^{-5}$ mol/L |
| 21 | Chloral hydrate | $C_2H_3Cl_3O_2$ | 165.40 | KCl 0.1 mol/L, 50% ethanol | –1.87 | $1.5 \cdot 10^{-5}$ mol/L |
| 22 | o-Chlornitromethane | $CH_2ClNO_2$ | 95.60 | Buffer 4.64 in 80% ethanol | –1.00 | $5.2 \cdot 10^{-5}$ mol/L |
| 23 | Cinnamic aldehyde | $C_9H_8O$ | 132.16 | 0.1 mol/L $NH_4Cl$ | –0.98 | $1.5 \cdot 10^{-5}$ mol/L |
| 24 | Citral | $C_{10}H_{16}O$ | 152.24 | $(C_2H_5)_4NI$ 0.1 mol/L in 80% ethanol | –1.60 | $2.5 \cdot 10^{-6}$ mol/L |
| 25 | Crystal violet | $C_{25}H_{30}ClN_3$ | 407.99 | Phosphate buffer pH 7.0, 1% ethanol | –0.88/–1.67 | $5 \cdot 10^{-6}$ mol/L |
| 26 | Cupferron | $C_6H_9N_3O_2$ | 155.16 | Mc Ilvaine buffer pH 3.0 | –0.75 | $1.3 \cdot 10^{-5}$ mol/L |
| 27 | Cyclohexanone | $C_6H_{10}O$ | 98.15 | $NH_3$ / $NH_4Cl$ 1 mol/L with 1% ethanol | –1.65 | $2.5 \cdot 10^{-4}$ mol/L |
| 28 | Cysteine | $C_3H_7NO_2S$ | 121.16 | $NH_3$ / $NH_4Cl$ 1 mol/L | –0.55 | $6.5 \cdot 10^{-6}$ mol/L |
| 29 | Cystine | $C_6H_{12}N_2O_4S_2$ | 240.30 | $NH_3$ / $NH_4Cl$ 1 mol/L | –1.00 | $1.7 \cdot 10^{-6}$ mol/L |
| 30 | Decanthiol | $C_{10}H_{22}S$ | 174.35 | 0.02 mol/L $H_2SO_4$ in 70% ethanol | –0.26 | $2.3 \cdot 10^{-5}$ mol/L |
| 31 | DDT | $C_{14}H_9Cl_5$ | 354.49 | $HNO_3$ / $H_2SO$ / $CH_3OH$ | –0.03 | $3 \cdot 10^{-7}$ mol/L |

| Nr. | Substance | Formula | Molecular weight | Supporting solution | Half wave potential | Determination limit |
|---|---|---|---|---|---|---|
| 32 | Dichlorphenolindophenol-Na | $C_{12}H_6Cl_2NO_2Na$ | 290.08 | Phosphate buffer pH 7.0 | +0.07 | $7 \cdot 10^{-6}$ mol/L |
| 33 | Diethylbarbituric acid | $C_8H_{12}N_2O_3$ | 184.20 | Borate buffer pH 9.0 | 0.00 | $1.1 \cdot 10^{-5}$ mol/L |
| 34 | Dimercaptopropanol | $C_3H_8OS_2$ | 124.22 | Acetate buffer pH 4.64 | −0.49 | $3.2 \cdot 10^{-6}$ mol/L |
| 35 | Dimethylglyoxime | $C_4H_8N_2O_2$ | 116.12 | $NH_3$ / $NH_4Cl$ | −1.70 | $7 \cdot 10^{-5}$ mol/L |
| 36 | 3.5-Dinitrobenzoic acid | $C_4H_4N_2O_6$ | 212.12 | Biphtalic buffer pH 4.0 | −0.22 | $7 \cdot 10^{-5}$ mol/L |
| 37 | 4.6-Dinitro-o-cresol | $C_7H_6N_2O_5$ | 198.14 | Borate buffer pH 9.0, 0.1 mol/L NaCl | −0.45/−0.55 | $1.5 \cdot 10^{-6}$ mol/L |
| 38 | α-Dinitrophenol | $C_6H_4N_2O_5$ | 184.11 | Phosphate buffer pH 7.0, 8% ethanol | −0.50/−0.85 | $1 \cdot 10^{-6}$ mol/L |
| 39 | 4,6-Dinitro-tert. butylphenol | $C_{10}H_{12}N_2O_5$ | 240.0 | Borate buffer 0.1 mol/L pH 11.9 | −0.65/−0.95 | $4.2 \cdot 10^{-6}$ mol/L |
| 40 | Flavone | $C_{15}H_{10}O_2$ | 222.25 | TBAOH/$CH_3COOH$ 0.05 mol/L in isopropanol | −1.35 | $5.5 \cdot 10^{-6}$ mol/L |
| 41 | Fructose | $C_6H_{12}O_6$ | 180.16 | $CaCl_2$ 0.05 mol/L | −1.70 | $4 \cdot 10^{-4}$ mol/L |
| 42 | Fumaric acid | $C_4H_4O_4$ | 116.08 | $NH_4Cl$ 0.05 mol/L | −1.60 | $1.7 \cdot 10^{-5}$ mol/L |
| 43 | l-Glutathione red. | $C_{10}H_{17}N_3O_6S$ | 307.33 | Britton-Robinson buffer pH 1.9 | −0.26 | $2.6 \cdot 10^{-5}$ mol/L |
| 44 | Hematin | $C_{16}H_{12}O_6$ | 300.27 | Borate buffer pH 9.0 | −0.37 | $7.5 \cdot 10^{-6}$ mol/L |
| 45 | Hexahydrobenzaldehyde | $C_7H_{12}O$ | 112.17 | 0.25 mol/L LiOH 10 °C | −1.92 | $0.9 \cdot 10^{-4}$ mol/L |
| 46 | α-Janone | $C_{13}H_{20}O$ | 192.30 | LiCl 0.2 mol/L, 50% ethanol | −1.60 | $5 \cdot 10^{-5}$ mol/L |
| 47 | Lactic acid | $C_3H_6O_3$ | 90.08 | LiOH 0.16 mol/L | −1.90 | $1 \cdot 10^{-4}$ mol/L |
| 48 | Maleic acid | $C_4H_4O_4$ | 116.08 | $NH_4Cl$ 0.5 mol/L | −1.25 | $5 \cdot 10^{-6}$ mol/L |
| 49 | Merfen (Phenyl mercuric borate) | $C_6H_5HgOB(OH)_2$ | 338.55 | Britton-Robinson buffer | −0.70 | $1.2 \cdot 10^{-5}$ mol/L |
| 50 | DL-Methionine | $C_5H_{11}NO_2S$ | 149.21 | Borate buffer pH 9.0 | −1.27 | $2.7 \cdot 10^{-5}$ mol/L |
| 51 | Naphtoquinone | $C_{10}H_6O_2$ | 158.16 | $NH_4NO_3$ saturated in benzene, benzine, methanol | −0.65 | $1.6 \cdot 10^{-4}$ mol/L |
| 52 | Neutral red | $C_{15}H_{17}ClN_4$ | 288.78 | Phosphate buffer pH 7.0, 1% ethanol | −0.57 | $1.4 \cdot 10^{-5}$ mol/L |
| 53 | Nicotine | $C_{10}H_{14}N_2$ | 162.24 | Borate buffer pH 8.0 | −1.50 | $5 \cdot 10^{-6}$ mol/L |
| 54 | Ninhydrine | $C_9H_6O_4$ | 178.14 | Phosphate buffer pH 7.0 | −1.02/−1.35 | $1.1 \cdot 10^{-5}$ mol/L |
| 55 | Nitroamino-p-cresol | $C_7H_8N_2O_3$ | 168.15 | Borate buffer pH 9.0 | −0.60 | $3 \cdot 10^{-6}$ mol/L |
| 56 | 5-Nitrobarbituric acid | $C_4H_3N_3O_5$ | 173.09 | Borate buffer pH 9.0 | −1.00 | $1 \cdot 10^{-6}$ mol/L |
| 57 | Nitrobenzaldehyde | $C_7H_5NO_3$ | 151.12 | Ethanol/dioxane 0.092 mol/L $H_3PO_4$/$(CH_3)_4NOH$ 0.196 mol/L | −0.80/−1.10/−1.70 | $5 \cdot 10^{-5}$ mol/L |
| 58 | m-Nitrobenzoic acid | $C_7H_5NO_4$ | 167.12 | Phosphate buffer pH 7.0, 10% ethanol | −0.70/−1.10 | $6 \cdot 10^{-5}$ mol/L |
| 59 | o-Nitrobenzoic acid | $C_7H_5NO_4$ | 167.12 | Phosphate buffer pH 7.0, 10% ethanol | −0.80/−1.10 | $6 \cdot 10^{-5}$ mol/L |
| 60 | Nitromethane | $CH_3NO_2$ | 61.04 | $H_2SO_4$ 0.05 mol/L | −0.75 | $1.5 \cdot 10^{-6}$ mol/L |
| 61 | o-Nitrophenol | $C_6H_5NO_3$ | 139.11 | Phosphate buffer pH 7.0, 8% ethanol | −0.50 | $5.8 \cdot 10^{-6}$ mol/L |
| 62 | Oxalic acid | $C_2H_2O_4 \cdot 2H_2O$ | 126.07 | KCl 0.1 mol/L | −1.72 | $2 \cdot 10^{-5}$ mol/L |

| Nr. | Substance | Formula | Molecular weight | Supporting solution | Half wave potential | Determination limit |
|---|---|---|---|---|---|---|
| 63 | Oxyquinoline (8-Hydroxyquinoline) | $C_9H_7NO$ | 145.16 | Borate buffer pH 9.0 | –0.02/–1.25 | $3 \cdot 10^{-5}$ mol/L |
| 64 | Papaverine | $C_{20}H_{21}NO_4$ | 339.40 | Phosphate buffer pH 7.0 | –1.49 | $1 \cdot 10^{-4}$ mol/L |
| 65 | Phthalic acid | $C_8H_6O_4$ | 166.13 | Biphthalate buffer pH 4.0 / $Ba(OOCCH_3)_2$ 0.1 mol/L | –1.50 | $5 \cdot 10^{-5}$ mol/L |
| 66 | Phthalimide | $C_8H_5NO_2$ | 147.14 | HCl 0.2 mol/L | –0.70 | $5.5 \cdot 10^{-6}$ mol/L |
| 67 | α-Picoline | $C_6H_7N$ | 93.13 | Borate buffer pH 9.0 | –1.82 | $4.3 \cdot 10^{-5}$ mol/L |
| 68 | Picric acid | $C_6H_3N_3O_7$ | 299.11 | LiOH / $CH_3COOH$ pH 4.2 | –0.25/–0.35/–0.50 | $1.7 \cdot 10^{-5}$ mol/L |
| 69 | Picrolonic acid | $C_{10}H_8N_4O_5$ | 264.20 | Acetate buffer pH 4.64 | –0.35/–0.65 | $2 \cdot 10^{-6}$ mol/L |
| 70 | Pyridine | $C_5H_5N$ | 79.10 | Borate buffer pH 9.0 | –1.49 | $1 \cdot 10^{-4}$ mol/L |
| 71 | Pyrogallol | $C_6H_6O_3$ | 126.11 | Phosphate buffer pH 7.0 | +0.11 | $1.6 \cdot 10^{-5}$ mol/L |
| 72 | Pyruvic acid | $C_3H_4O_3$ | 88.06 | Britton-Robinson buffer pH 3.2 | –1.10 | $0.9 \cdot 10^{-5}$ mol/L |
| 73 | Quercetin | $C_{15}H_{10}O_7 \cdot 2H_2O$ | 338.28 | Phosphate buffer | –1.61 | $5 \cdot 10^{-5}$ mol/L |
| 74 | Quinaldic acid | $C_{10}H_7NO_2$ | 173.17 | Acetate buffer pH 4.64, gelatine | –0.90/–1.10 | $1.2 \cdot 10^{-5}$ mol/L |
| 75 | Quinhydrone | $C_{12}H_{10}O_4$ | 218.21 | Borate buffer pH 9.0, 50% methanol | +0.05 | $1.1 \cdot 10^{-5}$ mol/L |
| 76 | Quinine | $C_{20}H_{24}N_2O_2$ | 324.43 | Acetate buffer pH 4.64 0.1 mol/L LiCl | –1.45 | $6 \cdot 10^{-6}$ mol/L |
| 77 | Quinizarine | $C_{14}H_8O_4$ | 240.22 | NaOH 0.1 mol/L | –0.81 | $1.1 \cdot 10^{-5}$ mol/L |
| 78 | Rhodamine B | $C_{29}H_{31}ClN_2O_3$ | 479.03 | NaOH 1 mol/L | –1.25/–1.80 | $5 \cdot 10^{-6}$ mol/L |
| 79 | Rubeamic acid (Dithiooxamide) | $C_2H_4N_2S_2$ | 120.20 | $NH_3$ / $NH_4Cl$ 0.5 mol/L | –0.35/–0.67/–0.88/–1.72 | $3.5 \cdot 10^{-5}$ mol/L |
| 80 | Saccharin | $C_7H_5O_3NS$ | 183.18 | HCl 0.05 mol/L | –1.20 | $1 \cdot 10^{-6}$ mol/L |
| 81 | Salicylaldoxime | $C_7H_7NO_2$ | 137.14 | Phosphate buffer pH 7.0 | –1.11 | $1.5 \cdot 10^{-5}$ mol/L |
| 82 | Salicylic acid | $C_7H_6O_3$ | 138.12 | LiCl 0.2 mol/L | –1.70 | $8.7 \cdot 10^{-5}$ mol/L |
| 83 | Sodium diethyldithiocarbamate | $C_5H_{10}S_2Na \cdot 3H_2O$ | 225.31 | $NH_3$ / $NH_4Cl$ 1 mol/L | –0.44 | $9 \cdot 10^{-6}$ mol/L |
| 84 | Sodium thiocarbonate | $Na_2CS_3$ | 154.20 | NaOH 0.1 mol/L | –0.75 | $2.5 \cdot 10^{-6}$ mol/L |
| 85 | Tartaric acid | $C_4H_6O_6$ | 150.09 | $(CH_3)_4NBr$ 0.05 mol/L | –1.65 | $5 \cdot 10^{-5}$ mol/L |
| 86 | Theophylline | $C_7H_8N_4O_2$ | 180.17 | Borate buffer pH 9.0 | +0.11 | $2.2 \cdot 10^{-5}$ mol/L |
| 87 | Thiocetamide | $C_2H_5NS$ | 75.13 | $NH_4NO_3$ 2 mol/L, with $NH_3$ on pH 9.4 | –0.09 | $2.7 \cdot 10^{-5}$ mol/L |
| 88 | Thiophenol | $C_6H_6S$ | 110.18 | $H_2SO_4$ 0.01 mol/L | –0.34 | $3.6 \cdot 10^{-5}$ mol/L |
| 89 | Thiourea | $CH_4N_2S$ | 76.12 | $HClO_4$ 0.1 mol/L | +0.10 | $3 \cdot 10^{-4}$ mol/L |
| 90 | Vanillin | $C_8H_8O_3$ | 152.15 | $NH_4Cl$ 0.1 mol/L in 50% ethanol | –1.45 | $2.5 \cdot 10^{-5}$ mol/L |
| 91 | Veronal | $C_8H_{12}N_2O_3$ | 184.19 | Borate buffer pH 9.0 | +0.15 | $4 \cdot 10^{-5}$ mol/L |
| 92 | Vitamin B (Nicotinamide) | $C_6H_6N_2O$ | 122.13 | $Na_2CO_3$ 0.2 mol/L | –1.70 | $1.6 \cdot 10^{-4}$ mol/L |
| 93 | Vitamin B 1 | $C_{12}H_{17}ClN_4OS \cdot HCl$ | 337.28 | Phosphate buffer pH 7.3 | –1.45 | $6 \cdot 10^{-5}$ mol/L |
| 94 | Vitamin B 2 | $C_{17}H_{20}N_4O_6$ | 376.38 | Phosphate buffer pH 6.8, 2% Urea | –0.37 | $2.7 \cdot 10^{-5}$ mol/L |

| Nr. | Substance | Formula | Molecular weight | Supporting solution | Half wave potential | Determination limit |
|---|---|---|---|---|---|---|
| 95 | Vitamin B 6 | $C_8H_{11}NO_3 \cdot HCl$ | 205.69 | KCl 0.4 mol/L | –1.90 | $7 \cdot 10^{-5}$ mol/L |
| 96 | Vitamin B 12 | $C_{63}H_{88}CoN_{14}O_{14}P$ | 1355.40 | $NH_3$ / $NH_4Cl$ 1 mol/L, 0.1% Dimethylglyoxime | –1.15 | $1.3 \cdot 10^{-6}$ mol/L |
| 97 | Vitamin BC (Folic acid) | $C_{19}H_{19}N_7O_6$ | 441.42 | Borate buffer pH 11.3 | –1.10 | $5 \cdot 10^{-5}$ mol/L |
| 98 | Vitamin C (Ascorbic acid) | $C_6H_8O_6$ | 176.13 | Acetic buffer pH 4.64 | +0.10 | $3 \cdot 10^{-5}$ mol/L |
| 99 | Vitamin K 3 | $C_{11}H_8O_2$ | 172.19 | Acetic buffer pH 4.64 in 92% ethanol | –0.20 | $1 \cdot 10^{-5}$ mol/L |
| 100 | Vitamin K 5 | $C_{11}H_{11}NO \cdot HCl$ | 209.68 | Phosphate buffer pH 6.8 | –0.12 | $2 \cdot 10^{-5}$ mol/L |
| 101 | Xanthone | $C_{13}H_8O_2$ | 192.61 | Buffer pH 9, 25% ethanol | –1.47 | $1 \cdot 10^{-5}$ mol/L |

**Note:** Substance which can only be polarographed indirectly:

| | | |
|---|---|---|
| No. 2 | Acetanilide: | after nitration ($HNO_3$ / $H_2SO_4$) |
| No. 10 | Aniline: | after diazotisation (HCl / $NaNO_2$) |
| No. 13 | Atropine sulfate: | after nitration ($HNO_3$ / $H_2SO_4$) |
| No. 31 | DDT: | after nitration ($HNO_3$ / $H_2SO_4$) |
| No. 50 | DL-Methionine: | after conversion to periodide |
| No. 96 | Vitamin B 12: | after fusion and extraction with dithizone |