$NiC_4N_4^{2-}$

$Ni(CN)_6^{4-}$,

Цианидные комплексы

1896
Vi-643

$Ni(CN)_2$, $Ni(CN)_4^{--}$, $(\circ H_f, \circ H_{aq})$.

Varet

4.Compt.rend.122,1123(1896)

Circ.500 Ja, W, F

1896

VI-642

$Ni(CN)_2$, $Ni(CN)_4^{2-}$ (ΔH_f, ΔHaq)

Varet

Compt. rend., 1896, 123, 118.

Circ. 500 Ja, W F

1957

VI-641

$Ni(CN)_2$ (Пр), $Ni(CN)_4^{--}$ (К)

Hume D.N., Kolthoff I.M.

J.Am.Chem.Soc., 1950, 72, 4423-6.

The polarography of the nickel cyanide complexes and the solubility and constitution of nickel cyanide.

ЭСТЬ ф. М.

Ja, CA., 1951, 3749b

1960

VI-646

$Ni(CN)_6^{4-}$ (ΔF_f, Kp)

Blackie M.S., Gold V.

J.Chem.Soc., 1959, Dec., 4037-4040.

The stability of the $Ni(CN)_6^{4-}$ ion

RX., 1960, 56497 Ja

1960

VI-644

$Ni(CN)_4^{2-}$ (Kp)

Freund H., Schneider C.R.

J.Amer.Chem.Soc.,1959,81,N18, 4780-83.

Determination of the cumulative dissociation constant of tetracyunonickelate (II) ion.

RX.,1960,21791 Ja

1962

VI-645

$/Ni(CN)_4/^{2-}$ (Kp)

Margerum D.W., Bydalek T.J.,
Bishop J.J.

J.Amer.Chem.Soc., 1961, 83, N8, 1791-1795.

Kinetics of nickel (II) ligand exchange reactions: cyanide ion and (ethylenedinitrilo) tetraacetate ion.

RX., 1962, 15B51 Ja Est(orig.

Ni-C-комплексы

Вф-1977-VI

1063

$Ni(CN)_4^{2-}$

ΔH_f

Thermodynamics of metal cyanide coordination. II. $\Delta G°$, $\Delta H°$, and $\Delta S°$ values for tetracyanoniccolate(II) ion formation in aqueous solution at 25°. James J. Christensen, Reed M. Izatt, John D. Hale, Russell T. Pack, and Gerald D. Watt (Brigham Young Univ., Provo, Utah). *Inorg. Chem.* 2, 337–9(1963); cf. *CA* 58, 71g. The thermodynamic formation const. of Ni-$(CN)_4^{--}$ in aq. soln. was detd. potentiometrically at 25°. The resulting log K value is 30.1 ± 0.2 ($\Delta G° = -41.1 \pm 0.3$ kcal./mole). A $\Delta H°$ value of −43.2 ± 0.2 kcal./mole for the formation of $Ni(CN)_4^{--}$ in aq. soln. was detd. calorimetrically at 25° with a simple calorimeter and a thermometric titration procedure at high and low ionic strengths, resp. Combination of the $\Delta G°$ and $\Delta H°$ values gives a value of −7 e.u. for $\Delta S°$. CA

C.A. 1963. 58. 10

96798

1977-VI 1963

$Ni(CN)_4^{--}$ (Kp, ΔG^o, ΔH^o, ΔS^o)

Christensen J.J., Izatt R.M., Hale J.D., Pack R.T., Watt G.D.

Inorg. Chem., 1963, 2, 337-9

Thermodynamics of metal cyanide roordination. II G, H^o, S^o values for tetracyaniccolate (II) ion formation in aqueous solution at 25°.

CA, 1963, 58, N 10, 9679b

Ja.

Есть ориг. F orig.

1965

$Ni(CN)_4^{2-}$

ВФ-4521-VI

Егоров А. М. Одинц З. К.

(Кр) Уч. науч. трудов Гос. научно исслед. ин-та Цв. мет. 1965, №23, 247-5

1966

VI-4521

$Zn(NH_3)_4^{2+}$; $Ag(NH_3)_2^{+}$,
$Cu(NH_3)_2^{+}$, $Fe(CN)_6^{4-}$, $Ni(CN)_4^{2-}$, $Ag(CN)_2^{-}$
$Hg(CN)_4^{2-}$, $HgBr_4^{2-}$, HgI_4^{2-}, $Ag(S_2O_3)_2^{3-}$ (Kp)
NH_3 (aq)(S^o).

Егоров А.М., Одинец З.К.

Сб.научн.трудов Гос.научн.иссл.Ин-та
Цветн.метал., 1965, №23, 247-5.
Температ.зависимость констант нестабильности
ряда комплексных ионов.

Ja, F CA, 1966, 64, N6, 7425f

1967

VI-3980

$Pd(CN)_4^{2-}$, ($\Delta H, \Delta G, \Delta S$)

$Ni(CN)_4^{2-}$.

Watt G.D., Eatough D., Izatt R.M.,
Christensen J.J.

Proc.Utah Acad.Sci.Arts, and Letters, 1965,
42, N2, 298-302.

A thermodynamic study of Pd^{2+}-CN-interaction.

RX., 1967, 19B550

Est/orig.

Ja, W.

$PtBr^{+}$, $PtBr_2$, $[Ni(CN)_4]^{2-}$, IC 1970

$Pd(CN)_2$, $[Co(CN)_4]^{2-}$, Cu(CN) (Kp) VI 7277

Inman D., Jones B., White S.H.

J. Inorg. and Nucl. Chem., 1970, 32, N3, 927-936 (Angl.)

Complex ions in molten salts. Bromo- and cyano-complexes of nickel(II), cobalt(II), palladium(II), platinum(II) and copper(I) in molten LiCl + KCl (59:41 mole %).

PIH Xuan, 1970

18B155

W B Op

Ni^{+2} — CN^-

1971

14 В145. Термодинамика координации металлов с цианидом. Часть IX. Величины lg K, $\Delta H°$ и $\Delta S°$ для систем Ni(2+)—, Zn(2+)—, Cd(2+)— и Hg(2+) —CN^- при 10, 25 и 40°. Izatt R. M., Johnston H. D., Eatough D. J., Hansen J. W., Christensen J. J. Thermodynamics of metal cyanide coordination. Part IX. Log K, $\Delta H°$, and $\Delta S°$ values for the Ni^{2+}-, Zn^{2+}-, Cd^{2+}-, and Hg^{2+}- CN^- systems at 10, 25 and 40° C. «Thermochim. acta». 1971. 2. № 1. 77—85 (англ.)

K c;
ΔH°; ΔS°

+3

X · 1971 · 14

Изучена термодинамика взаимодействия M(2+) с CN^-, протекающего по р-циям: $M(CN)_{i-1}^{3-i} + CN^- \rightleftharpoons M(CN)_i^{2-i}$ (1) и $M^{2+} + iCN^- \rightleftharpoons M(CN)_i^{2-i}$ (2), где M(2+) = Ni, Zn, Cd и Hg. При 10, 25 и 40° и ионной силе, равной 0, найдены константы равновесия, изменения свободной энергии, энтальпии $\Delta H°$ и энтропии р-ций (1) (i=3 и 4 для M=Zn; i=1, 2, 3 и 4 для M=Cd и Hg) и р-ций (2) (i=2 для M=Zn; i=4 для M=Ni, Zn, Cd и Hg). Из зависимости $\Delta H°$ от т-ры вычислены величины $\Delta C_p°$. Сообщ. VIII см. РЖХим, 1969, 13Б726.

Е. Ф. Перегудов

Ni^{2+} CN^-

1971

68478v Thermodynamics of metal cyanide coordination. IX. Log K, ΔH^0, and ΔS^0 values for the Ni^{2+}–, Zn^{2+}–, Cd^{2+}–, and Hg^{2+}–CN^- systems at 10, 25, and 40°. Izatt, Reed M.; Johnston, Harlin Dee; Eatough, Delbert J.; Hansen, James W.; Christensen, James J. (Dep. Chem., Brigham Young Univ., Provo, Utah). *Thermochimica Acta* 1971, 2(1), 77–85 (Eng). Log K, ΔH^0, and ΔS^0 values valid at zero ionic strength are reported or summarized from previous studies for CN^- interaction with bivalent Ni, Zn, Cd, and Hg at 10, 25, and 40°. From the values of ΔH^0 as a function of temp. av. ΔC_p^0 values are calcd.
RCBBV

log K,
ΔH^0
ΔS^0

−
+
−

+3

C.A. 1971. 74. 14

$Ni(CN)_5^{3-}$ — ВР-XVI-578 1971.

11 В117. Образование в растворе пентацианоникелоат-иона из тетрацианоникелоат-иона. Pierrard Jean-Claude, Hugel René. Formation d'un ion pentacyanonickelate (II) à partir de l'ion tétracyanonickelate (II) en solution. Rev. chim. minér.», 1971, 8, № 6, 831—840 (франц.; рез. англ., исп., нем.)

Спектрофотометрическим методом при 20±0,3° в 0,02 М водн. р-ре $Na_2[Ni(CN)_4]$ в 2 М $NaClO_4$ в присутствии CN^--ионов исследовано равновесие: $Ni(CN)_4^{2-}+CN^- \rightleftharpoons Ni(CN)_5^{3-}$. Константы равновесия р-ции найдена равной 0,168±0,003. Величина константы сравнивается с имеющимися в лит-ре и отмечается их хорошее соответствие. Представлены спектры ионов $Ni(CN)_4^{2-}$ и $Ni(CN)_5^{3-}$ в области 390—520 нм. Э. А. Межов

X.1972.11

$Ni(CN)_5^{3-}$

BP- XVI-518

1971

104587g Formation in solution of a pentacyanonickelate(II) ion from the tetracyanonickelate(II) ion. Pierrard, Jean C.; Hugel, Rene (Lab. Chim. Miner. I, Univ. Reims, Rheims, Fr.). *Rev. Chim. Miner.* 1971, 8(6), 831–40 (Fr). The formation of pentacyanonickelate(II) ion from NaCN and $Na_2Ni(CN)_4.3H_2O$ was detd. spectrophotometrically. The equil. const. of $Ni(CN)_4^{2-} + CN^- \rightleftharpoons Ni(CN)_5^{3-}$ is 0.168 ± 0.003 l. mole^{-1}. No other complex ion was detected.

R. Razouk

Kp

C.A. 1972. 76.18

$H_2Ni(CN)_4$

1974

$\Delta H^\circ, \Delta G^\circ$

ΔS; K иониз

159801f Protonation of tetracyanonickelate(II). Kabir-ud-Din (Dep. Chem., Aligarh Muslim Univ., Aligarh, India). *Z. Phys. Chem.* (*Frankfurt am Main*) 1974, 88(1-6), 316-22 (Eng). The ionization consts. K_1 and K_2 of $H_2Ni(CN)_4$, detd. in aq. soln. by electrometry at 25-50°, obeyed the relations $pK_1 = 11{,}419.90/T - 69.65 + 0.1219\ T$ and $pK_2 = 5777.98/T - 32.74 + 0.0669\ T$. The thermodn. quantities for the ionization at 30° were ΔG° = -6.47 and -9.17 kcal mole^{-1}, ΔH° = -0.98 and +1.7 kcal mole^{-1}, ΔS° = +18.2 and +35.9 cal mole^{-1} degrees^{-1} and ΔC_p° = +338.2 and +1.85.6 cal mole^{-1} degree^{-1}, resp.

C.A. 1974. 81 N 24

$NiCN^+$, $Ni(CN)_4^{2-}$ 1974

(Lead)

77198s Complex formation in the nickel(II)–cyanide system. Persson, Hans (Chem. Cent., Univ. of Lund, S-220 07 Lund, Swed.). *Acta Chem. Scand., Ser. A* 1974, A28(2), 91–101 (Eng). The formation of complexes in aq. soln. Ni^{2+}–CN^- was studied by potentiometric measurements with a glass electrode at 25.0° and ionic strength 3.0 *M* ($NaClO_4$). These measurements can best be described if two mononuclear complexes, $NiCN^+$ and $Ni(CN)_4^{2-}$, are assumed to exist with stability consts. β_1 = (1.05 ± 0.15) × 10^{10} M^{-1} and β_4 = (1.16 ± 0.05) × 10^{30} M^{-4}, resp. (the error limits are three times the std. deviations). The intermediate complexes $Ni(CN)_2$ and $Ni(CN)_3^-$ are so weak that the corresponding

C.A. 1975, 82 n 12

stability [illegible] be d. β_5. From the calcns. approx. max. values of β_5 and β_6 were estd. to be 9 × $10^{[illegible]}$ $M^{[illegible]}$ and 1 × $10^{[illegible]}$ $M^{[illegible]}$, resp. There was no sign of any fifth or sixth mononuclear complex in the ligand range that was investigated. The conclusion that $Ni(CN)_5$ [illegible] is a very strong complex can definitely be discarded. Protonated Ni cyanide complexes have been reported to dominate the complex formation at pH <5. In the present investigation no such complexes could be discovered although a careful anal. of potentiometric data in this pH region was performed. Protonated Ni cyanide complexes, if they exist at all, must therefore be far weaker than suggested previously (Kolski, G.B., and Margerum, D.W., 1968). The fourth mononuclear complex strongly dominates the complex formation, and the potentiometric measurements indicate a max. amt. of $NiCN^+$ of only (10 ± 4) %. Therefore spectrophotometric investigations were performed to verify the existence of the first complex. No positive evidence of $NiCN^+$ was obtained, however, indicating that the first complex is considerably weaker than suggested by the results from the potentiometric measurements. The value of β_1 given above may be regarded as a max. value.