

Ры-ночки

Ры (III), IV и др. опис. составили

$\text{Pu}^{+2}(\text{aq})$

[Om. 25544]

1947

Evans M. W.,

$\Delta_f H,$
S₂₉₈

United States Atomic.
Energy Commission,
MAAC-1206 August 27,
1947.

Pu⁺³

BGP - HAK 42 - VIII 1949

Pu⁺⁴

Evans M.W.

(ΔH)

The Transuranium
Elements ...

p 282-294 paper 3.30

Pu^{3+}

Bq-1100-VI

1949

Pu^{4+}

Evans M. W.

(4H, 4S)

Natl. Nucl. Energy

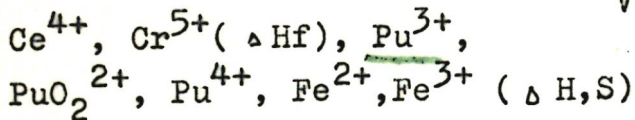
Ser. Div. IV 14B

Transition Elements

1949, Pt 1, 282-94

1949

VI-1100



Evans M.V.

Nafl. Nuclear Energy Ser., Div. 1V, 14B,
 Transuranium Elements, 1949, Pt I, 282-94.

Heats and entropies of Pu(III), Pu(IV), and
 Pu(VI) in 0, % M perchloric acid at 25°.

Est/F.

ESTB O. K.

W,

CA., 1951, 1414h

VIII 1578 1949

Pu⁺⁺⁺⁺ (.K aq)

Hindman J.C.,

Natl. Nuclear Energy Ser., Div. IV, 148

Transuranium Elements, 1949, Pt. I, 370

-387

Ionic species of plutonium present
in aqueous solutions of different
acids

CA, 1950, 44, 3830c

Dis

VIII -4810

1949

PuO_2^{2+} , Pu^{3+} , Pu^{4+} (p-p, HCl, HClO_4)
(E° , K_p)

Kasha M.,
Nat. Nuclear Energie. Ser.,
1949, IV-148, 295
B

VIII 1216

1949

Pu³⁺, Pu⁴⁺, Pu⁵⁺, Pu⁶⁺ (K)
Pu(OH)₄ (ПР)

Kasha M.,

Nat. Nuclear Energy Ser., Div. IV, 148,
Transuranium Elements,
1949, part 1, 295-334

CA, 1950, 44, 3830e

As

Pu^{3+}

[49 RO13/WES]

1949

Robinson H.P., Westrum Jr., E.F.

The dependence of the heat of solution of plutonium trichloride on the concentration of hydrochloric acid in:

The transactinoid elements. New York: McGraw-Hill, 1949, p. 922-25, Seaborg G.T., Katz J.J., Manning W.M. editors.

VIII 2308

1949

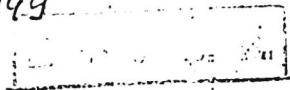
Pu⁴⁺, PuF₃, PuCl₃, PuOCl, PuBr₃, Np³⁺, Np⁴⁺,
NpO₂⁺, NpO₂²⁺. (ΔH_f°)

PuF₃, PuCl₃, PuBr₃ (T_s, ΔH_s , T_b, ΔH_b)

Seaborg G.T., Katz J.J., Manning W.M.
The Transuranium Elements. Research
Papers, National Nuclear Energy Series,
14B, New York, Mc. Graw-Hill Book Co.
1949

Circ 500

U, B



U⁴⁺, P₄⁴⁺

(K_p)

UOH³⁺

PuOH³⁺

1950
Kraus K. A., Nelson F.

J. amer. chem. Soc.,

1950, 72, 3901-6

VIII 5019

B. by letter & k



8 may

VIII-4553 1957
 Pu^{4+}, Pu^{3+} (P-P, $HClO_4$). (ΔH)

Connick R.E., ~~McVey~~ McVey W.H.,
J. Amer. Chem. Soc., 1957, 73, 1798



B

VIII - 2112

1957

Pu⁴⁺, Pu³⁺ (p-p, HClO₄) (ΔH)

Rabideau S.W., ~~and~~ Lemons J. F.,
J. Amer. Chem. Soc., 1957, 73, 2895

B

VIII - 4554

1952

Pu⁴⁺, Pu³⁺ (p-p, HCl) (E° ; Kp)

Connick R.E., ~~McVey~~ McVey W.H.,

J. Amer. Chem. Soc., 1952, 74, 1341



B

3

VIII - 4789

1953

PuO_2^{2+} , Pu^{3+} , Pu^{4+} , $PuCl^{2+}$ (p-p; H_2O) (K_p , E°)

Connick R.E., McVey W.H.,
J. Amer. Chem. Soc., 1953, 75, 474.

B.

1953

VIII 1999

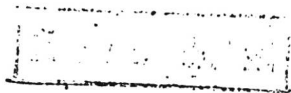
Pu³⁺, Pu⁴⁺, PuO₂²⁺, PuCl³⁺.

(ΔF , ΔH , ΔS , K_p)

Rabideau S.W., Cowan H.D.,

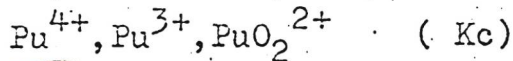
J. Amer. Chem. Soc., 1953, 77, n23,
6145-6148.

Puck, 1956, n22, 71404 B. Dy



VIII 1995

1953



Rabideau S.W.,

J. Amer. Chem. Soc., 1953, 75, N 4, 798-801

Equilibria and reaction rates in the
disproportionation of Pu (IV)

PuChen, 1955, N 10, 18346

RECEIVED
JUL 1955

Pu^{4+}

[55RAB/COW]

1955

Rabinovich S.W., Cowan H.D.,
"Chloride complexing and disproportiona-
tion of Pu(IV) in hydrochloric acid"
J. Am. Chem. Soc., 1955, 77, p. 6145-48.

A - 1388

1955

Лантаноиды и диоксиды.

Ac, Th, U, Np, Pu, Am, La, Ce, Pr, Nd

Ионы Ac, Th, U, Np, Pu, Am, La, Ce, Pr, Nd

(ΔHf)
(ΔNaq)

Серебренников В.В., Серебренникова И.А.,

Учен. зап. Ташкентского ун-та,

1955, № 26, 9-15

М, В
РЖХ, 1957, 14629

1956

$Pu(Cu)_3$ Newton T.W., Baker F.B.

$Pu(Cu)_4$ JACS, 1956, —, N, 1417

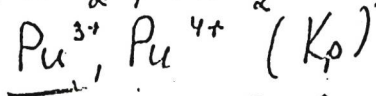
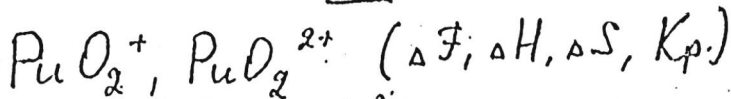
P-групп $Pu(III)$ и O_2 в лодч. p-раx
сублимации

~~V-1214~~

V-1210

VIII 1996

1956



Rabideau S.W.,

J. Amer. Chem. Soc., 1956, 78, 2705-2707

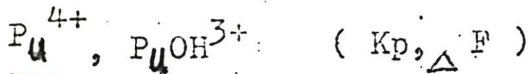
M. J.

NOTL 6. 11

Puex, 1957, 40750

VIII 1997ⁿ

1957

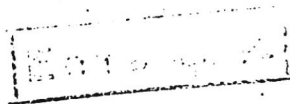


Rabidean^u S.W.,

J. Amer. Chem. Soc., 1957, 79, N 14, 3675-3677

The hydrolysis of plutonium (IV)

P~~u~~Chem., 1958, 10681



Dis

Pu^{4+} ; Pu^{3+} ; PuO_2^{2+}

УИИ 2678

1958

Артюхин П.И., Гельман А.Д., Медведовский
В.И.,

Докл. АН СССР, 1958, 120, № I, 98-100

Исследование окислительно-восстановительных
потенциалов плутония в азотной кислоте

РЖХим., 1958, № 24, 80837

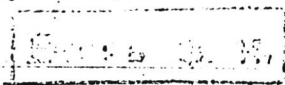
Яц

VIII 2000 1958
Pu³⁺, PuO₂²⁺, Pu⁴⁺, PuO₂⁺ ($K_p, \Delta F, \Delta H, \Delta S$)

Rabideau S.W., Kline R. J.,
J. Phys. Chem., 1958, 62, 617-620

U.B.

PRX, 1958, v24, 80709



VIII - 4808

1950

NpO_2SO_4 , NpCl^{3+} , Pu^{3+} , Pu^{4+} (p-p; H_2O) (E° ; K_p)

Stromatt R. W., Pee King R. M.,

Scott F. A., 1958, HW-58212

(Hanford Works)



B.

VIII - ~~4641~~ 4641, 1959

Pu⁶⁺, Pu³⁺, Pu⁴⁺ (p-p, HNO₃) (E°, Kp)

Артюшкин Т. И., Свердловский В. И.,
и Чибилкин А. Я.,

Ж. неорг. химии, 1959, 4, 1324



В

Pu^{4+}

[62 SCH/NEB]

1962

Schwabe K., Nebel D.

"Potentiometric studies on plutonium.
I Investigation of the complex
formation between Pu(IV) and Pu(III)
and acetate ions". Z. Phys. Chem.
(Leipzig), 1962, 220, p. 339-354.

1963

Pu II, Pu III (Te) VIII 1111

Bauche J., Blaise J., Fred M.,
C. r. Acad. sci., 1963, 256, 5091-5093

10

Рябков, 1964, 20-25 лето опр.

VIII 1496. 1963
Pu³⁺, Am³⁺, PuCl₃, AmCl₃, PuOCl,
AmOCl (Δ Hf)

Fuger J., Cunningham B. B.,
J. Inorg. and Nucl. Chem.,
1963, 25, 111, 1423-1429

РМХ, 1964, 136411 B, M есть опир.

1965

U, U⁺, Pu⁺, Pu (p, H_T-H_O, S^o_T)

Gurvich L.V., Yungman V.S.

Thermodynamics, Proc. Symp. Vienna,

1965, 2, 613-619

Введение периодических
функций газодинамических
уравнений, полученных и на
интервал до 20 000°K

M

Pu^{3+}

[66 AKH]

1966

Akhachinsky V.V.

"The heat of solution of plutonium
in hydrochloric acid" in:

"Thermodynamics, Proc. Symp. held in
Vienna, Austria, 22-27 July 1965"

vol. 2, Vienna, Austria: International
Atomic Energy Agency, 1966 p. 561-570,
in Russian.

Pu⁴⁺

[66 RAN]

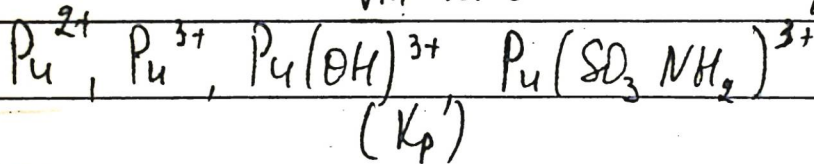
1966

Rand M.H., "Thermochemical properties,
in: Plutonium: Physicochemical properties
of its compounds and alloys".

At. Energy Rev, 1966, 4, p. 7-51.

VIII 2110

1968



Cleveland J. M.

Inorganic Chemistry, 1968, 7, 874-878

Lu

лет 9. К

№, Рн (св-ва)

86 VII 3523 1969

Крот Н.Н.; Гельман А.Д.; Смирнов
В.И.

Ж. геогр. ж. 1969, 14(10), 2633-9

Выводы о состоянии
транскраниальных элементов и
их включение в периферическую
систему Менделеева. 6

В (СФ)

~~См. также ж. 1970, 14(10), 2633-9~~

СА, 1970, 72, №4, 158032

$Pu^+(I)$, Pu_2C_3 , $PuCl_2$ (ΔG_f° , ΔH°) 1970

$PuCl_{1.5}$ (ΔH_f° , ΔG_f° , ΔH°) ⁸ VIII 3555

Battles J.E., Shinn P.E., Blackburn P.E.
Edwards R.K.

High Temp. Sci., 1970, 2, 11, 80-93 (corr.)
A mass spectrometric study of the volatilization behavior in the plutonium-carbon system.

PIH Jan, 1970
155716

9 M, 10 (9)

$\text{Pu}^{3+} \text{aq.} (S^\circ) \text{ cm}^3 (S)$ 1970
 $\text{PuCl}_3 \cdot 6\text{H}_2\text{O} (\Delta H \text{aq.}) \text{ PuCl}_3$ VIII 3730

Hinchey R. J., Cobble J. W.,
Inorg. Chem., 1970, 9, No 4, 922-5 (am.)

Thermodynamic functions for Pu^{3+}
and the entropies for some trivalent
actinide ions.

B, M 5 (9) CA, 1970, 72, 1122, 115422t

Cs_2NaCl_6 , Cs_2NaCl_6 , Cs_2NaCl_6 (ΔH_{soen} , ΔH_{aq}) 1971
 Cs_2NaCl_6 , Cs_2NaCl_6 , Cs_2NaCl_6 (ΔH_f)
 Y^{3+} , La^{3+} , Ce^{3+} , Gd^{3+} , Ni^{3+} (ΔH_f) 10 8
 Er^{3+} , Er^{3+} , Lu^{3+} , Pu^{3+}
VIII 4325

J. Phys. Chem., 1971, 75, N°3, 392-9 (ann.)
 Thermochemistry of some chlorocom-
 plex compounds of the rare earths.
 Third ionization potentials and
 hydration enthalpies of the triva-
 lent ions.

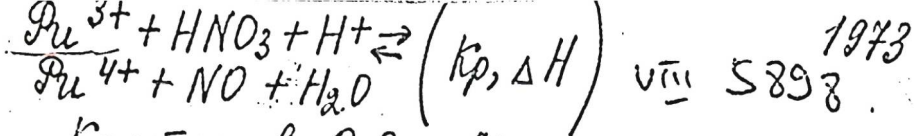
B© 25 CA, 1971, 74, N14, 6851a

Pu(IV)

[72 MET/GUI]

1972

Metivier H, Guilbaumont R.
Hydrolyse du plutonium
tétravalent "
Radiochim. Radioanal. Lett.
1972, 10, 2735, in French.



Колтунов В.С., Марченко В.И.,

Радиохимия, 1973, 15, N5, 748-50
(русск.).

Реакция между плутонием
и азотной кислотой. I. Равно-
весие.

В



СА, 1974, 80, N8, 41540и

Pu⁴⁺, Pu³⁺ (Kp, ΔH, ΔS) XVIII 244 1974

Landresse G., Ducasquet G.

Inorg. and Nucl. Chem. Lett., 1974, 10, NII,
1051-1057 (франц)

Экспериментальное исследование методом
абсорбционной спектроскопии равновесия
$$Pu^{4+} + Cl^- \rightleftharpoons Pu^{3+} + \frac{1}{2} Cl_2$$
 в растворе LiCl-CuCl
(55-45 мол %)

РИХХИ, 1975

75933

В (9) не есть

3

$Ac^{3+}, Th^{3+}, Pa^{3+}, U^{3+}, Np^{3+}, Pu^{3+}, Am^{3+}$ 1975
 $Cm^{3+}, Bk^{3+}, Cf^{3+}, Es^{3+}, Fm^{3+}, Md^{3+}, No^{3+}, Lr^{3+} (\Delta G)$

Goldman Saul, Moss Lester R.

Can. J. Chem., 1975, 53, N18, 2695-2700 (a.u.)

Semiempirical calculations on the free energy
and enthalpy of hydration for the trivalent
lanthanides and actinides. XVIII-644

PIHXUM, 1976

20 65797

Ly, B, M, (9)
Xop

Pu^{3+}

[FUG/OET]

1976

Fuger H., Oetting F. Z., The chemical thermodynamics of actinide elements and compounds: Part 2. The actinide aqueous ions. Vienna: International Atomic Energy Agency, 1976, 65p.

Pu^{3+}

Lommeda 106171

1980.

m. juv.

cl-b²

Commenced

12/2/81.

p-pl

Fuger J; et al.

Proc. Sympos. Nuclear
Materials. IAEA, Vienna,
1980, Vol. II p. 59-74

1980

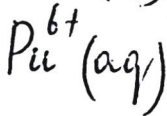
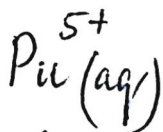
$\text{Pu}^+(\text{aq})$

Lemie R. Y., et al.,
J. Chem. Eng. Data 1980,
25(4), 361-70.

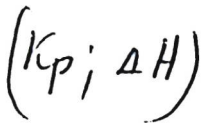
ΔG_f

(cell. $\text{U}^+(\text{aq}); \text{I}$)

1980



93: 13979w Equilibrium of the reduction of plutonium(VI) by nitrous acid. Ryabova, A. A.; Koltunov, V. S.; Marchenko, V. I. (USSR). *Radiokhimiya* 1980, 22(2), 254-9 (Russ). The redn. equil. in the Pu(VI)-Pu(V)-HNO₂-HNO₃ system was studied spectrophotometrically at ionic strength 2 and at 15-40°. The equil. const. $K = [\text{Pu(V)}]^2[\text{H}^+]^3[\text{NO}_3^-]/[\text{Pu(VI)}]^2[\text{HNO}_2] = 1.05 \pm 0.22 \text{ M}^3$ at 22°. The heat of reaction is $\sim 2 \text{ kcal/mol}$.



CA 1980 93 N2

Pu^{3+}

1980

Pu^{4+}

94:37333c Plutonium(4+) thermodynamics in alkali metal chloride melts. Savochkin, Yu. P.; Sabanova, T. I.; Skiba, O. V. (Nauchno-Issled. Inst. At. Reakt., Dimitrovgrad, USSR). Report 1979, NIIR-37(396). 16 pp. (Russ). Avail. INIS. From INIS Atomindex 1980, 11(18), Abstr. No. 548260. Spectrometry was used to detn. the equil. const. of Pu^{5+} oxidn. by alkali metal chloride melts. The stability of the Pu^{4+} formed increases with increasing cation radius of the salt. Pu^{4+} thermodyn. in alkali metal chloride melts were detd. from Pu^{3+} thermodyn. values and the equil. consts. detd.

(Кемаδ.)

C.A. 1981:94NG

P_4^+
4910

Зембеуков А. П., 1981
Зав~~е~~скупия В. Д.,
Кушков В. В.

Юннелар

Жури. тек. гонимки,
1981, 51, 130

207

$P_4^+(m.x.)$, $U^+(m.x.)$

$Pu(3+)$, $Pu(4+)$

1981

✓ 12 Б656. Диаграмма работы для плутония. Silver G. L. Work diagram for plutonium. «J. Inorg. and Nucl. Chem.», 1981, 43, № 11, 2997—2999 (англ.)

диаграмма
работы

Для водн. р-ров Pu построена диаграмма работы в координатах «свободная энергия, кал — pH », показывающая, сколько работы (ΔG , кал) надо затратить для перевода 1 ммоль Pu , первоначально присутствующего в 1 л р-ра только в виде $Pu(3+)$ в новое состояние, в к-ром $Pu(3+)$ находится в равновесии с Pu в др. степени окисления. Напр., при $pH = -1$ требуется затратить 10,9 кал для перевода 1 ммоль $Pu(3+)$ в 1 л воды в смесь эквимол. количеств $Pu(3+)$ и $Pu(4+)$.

С. С. Бердонос

X. 1982, 19, N 12.

Pu(4+) (aq)

1982

З Б1861. Гидролиз ионов плутония (IV). Першин А. С., Сапожникова Т. В. «2 Всес. конф. по химии нептуния и плутония, Ленинград, 23—25 нояб., 1982. Тез. докл.» Л., 1982, 63

Изучен гидролиз Pu(4+) в водн. р-рах в интервале рН 0,9—2,0 и конц-ий металла 10^{-6} — $3,3 \cdot 10^{-3}$ М. На основе полученных данных ориентировочно установлена область «характеристич. кривой гидролиза» Pu(4+), к-рая расположена в области более высоких значений рН, чем кривая, рассчитанная из значений констант гидролиза, приведенных в литературе. А. С. Соловкин

Kp;

х. 1983, 19, w3

Pu^{3+} (aq)

[от. 16995]

Pu^{+4} (aq)

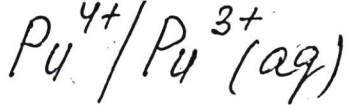
Фузер Г.

получено от Г. Фузера
в семье. 1983г.

Kp;

ссылка пока нет -

это часть будущей
книжки.

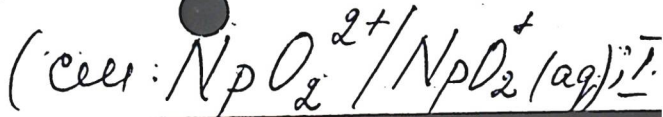


1984

Blanc P., Madic C.

Inorg. Chim. Acta, 1984,

94, N1-3, 134-136.



Pu^{3+}

[om. 23459]

1984

Pu^{4+}

Marcus V., Loewenschuss A.,

S;

Ann. rept. Progress Chemistry,
Section C, Physical Chemist-
ry, 1984, C81, 81-135, Chem. Soc.

● (London)

Pu^{3+}_{aq}

1985

David F., Fournest B., Duplezzi's J.
Термодинамика гидратации Pu_{aq}
и трансмутационных ионов

J. Nucl. Mat., 1985, v. 130, p. 273-279

есть реферат!

$Pu^{+2}(aq)$

[Om. 25041]

1986

$Pu^{+3}(aq)$

David F.,

$Pu^{+4}(aq)$

J. Less-Common

Metals, 1986, 121,

S. Ash,

● 27-42.

~~24~~ Pu ²⁺

1988

Михеев Н. Б.

Двухвалентный плутоний и некоторые его свойства
// Радиохимия. — 1988. — Т. 30, вып. 1. — С. 16—20.
Библиогр. : 9 назв.
— — 1. Плутоний (2) — Реакции.

№ 73844

18 № 3272

НПО ВКП 14.07.88

УДК 546.799.4

ЕКЛ 17.4

Pu^{3+}
 Pu^{2+}

(Om. 28948)

1988

Мухеев Н.Б., Казакевич М.З.
и др.,

(Кс)

Радиохимия, 1988, №2,
268-270. ●

Pu(VI)

[88U22/SCH]

1988

Ullman W. J., Schreiner F.
"Calorimetric determination of the
enthalpies of the carbonate
complexes of U(VI), Np(VI) and Pu(VI)
in aqueous solution at 25°C."

Radiochim. Acta, 1988, 43, 37-44

Pu⁴⁺

[89 RIG/ROB]

1989

Riglet C, Robouch P, Vitorge P.
„Standard potentials of the
($\text{MO}_2^{2+}/\text{MO}_2^+$) and ($\text{M}^{4+}/\text{M}^{3+}$) redox systems
for neptunium and plutonium.”

Radiochim. Acta, 1989, 46, p. 85-94

Pu^{4+}

[92CAP/VIT]

1992

Capdevila, H., Vitorge, P., Ciffaut E.,
" Stability of pentavalent plutonium.
Spectrophotometric study of PuO_2^+ and
 Pu^{4+} disproportionation in perchloric
media " Radiochem. Acta, 1992, 58/59,
p. 45-52.

Pu⁴⁺

[92CAP]

1992

Capdevila, H.

Données thermodynamiques sur
l'oxydoreduction du plutonium en
milieu acide et carbonate.

Stabilité de Pu(V). Ph. D. thesis.

Université de Paris-Sud, Orsay, France,
1992, in French. Also published as CEA-
R-5643 ● Commissariat à l'énergie
atomique, France, 1993, 197p.

Pu^{3+}

[92CAP]

1992

Capdevilla, H. Données thermodynamiques sur l'oxydoréduction du plutonium en milieux acide et carbonate.

Stabilité de Pu(V) . Ph.D. thesis. Université de Paris-Sud, Orsay, France, 1992, in French. Also published as CEA-R-5643 Commissariat à l'énergie atomique France, 1993, p.137. ●

Pu^{3+}

[92 CAPP/VIT]

1992

Capdeville H, Vitorge, P, Giffaut E,
"Stability of pentavalent plutonium.
Spectrophotometric study of PuO_2^+ and
 Pu^{4+} disproportionation in perchloric
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Pu^{4+}

1993

Reznitskii L. A.

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(AM)

● (see Tb^{4+} ; I)

Угрозны Pu (VI) u U (VI)

1994

121: 309483q Thermodynamics of Uranium(VI) and Plutonium(VI) hydrolysis. Rizkalla, E. N.; Rao, L. F.; Choppin, G. R.; Sullivan, J. C. (Chem. Dep., Florida State Univ., Tallahassee, FL 32306-3006 USA). *Radiochim. Acta* 1994, 65(1), 23-7 (Eng). The thermodyn. parameters for the hydrolysis of hexavalent uranyl and plutonyl ions were detd. by calorimetric titrn. in the presence of 1.0 M tetramethylammonium chloride and 1.0 M sodium perchlorate as background electrolytes for these ions, resp. The measurements were obtained at 25° over a wide range of $\bar{n}$ values and at different initial metal concns. to ensure reliability of data. The values for the consts. and the corresponding reactions are: $2\text{UO}_2^{2+} + 2\text{H}_2\text{O} \leftrightarrow [(\text{UO}_2)_2(\text{OH})_2]^{2+} + 2\text{H}^+$ $\Delta H_{22} = 44.4 \pm 1.9 \text{ kJ mol}^{-1}$; $\Delta S_{22} = 36 \pm 6 \text{ J K}^{-1} \text{ mol}^{-1}$; $\text{PuO}_2^{2+} + \text{H}_2\text{O} \leftrightarrow \text{PuO}_2(\text{OH})^+ + \text{H}^+$ $\Delta H_{11} = 28.0 \pm 5.0 \text{ kJ mol}^{-1}$; $\Delta S_{11} = 4 \pm 17 \text{ J K}^{-1} \text{ mol}^{-1}$ and $\text{PuO}_2^{2+} + 2\text{H}_2\text{O} \leftrightarrow \text{PuO}_2(\text{OH})_2 + 2\text{H}^+$ $\Delta H_{12} = 42.6 \pm 7.0 \text{ kJ mol}^{-1}$; $\Delta S_{12} = -48 \pm 23 \text{ J K}^{-1} \text{ mol}^{-1}$. These values are compared to the literature data.

Ⓜ ⊠ Угрозны U(VI)
с. А. 1994, 121, 226

Pu(VI)

[94 RIZ / RAO]

1994

Rizkalla E. N.; Rao Z. F.; Coppin G. R.;
Sullivan J. C.

"Thermodynamics of U(VI) and Pu(VI)
hydrolysis."

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Pu(IV)

[94 YAM/SAC]

1994

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$\text{Pu}^{4+}/\text{Pu}^{3+}$

1995

122: 225103y Redox potentials of $\text{PuO}_2^{2+}/\text{PuO}_2^+$ and $\text{Pu}^{4+}/\text{Pu}^{3+}$ at different ionic strengths and temperatures. Entropy and heat capacity. Capdevila, Helene; Vitorge, Pierre (Section de Geochimie, CEA, F-92265 Fontenay aux Roses, Fr.). *Radiochim. Acta* 1995, 68(1), 51-62 (Eng). The redox potentials of the reversible couples of Pu are measured by using cyclic voltammetry, in perchloric media at ionic strength I , and temp. T . At each T , the exptl. results, $E(T, I)$, are extrapolated to $I = 0$ by applying the Specific Interaction Theory (S.I.T.) to get interaction coeffs. $\Delta\epsilon(T)$, and $E(0, T)$ (e.g., std. potential E° , when $T = 25^\circ$). A systematic error due to disproportionation or redox impurities could explain some discrepancies obsd. between numerical values already published. The exptl. data are fitted to the following series expansion about T° : The entropy changes ΔS , and heat capacity changes ΔC_p , are then detd. A 2nd order expansion of $\Delta\epsilon(T)$ and of the Debye Hueckel term were used to propose extended S.I.T. equations that account for both the ionic strength and the temp. influences on ΔG , ΔS , ΔC_p , ΔH , and ΔK . These equations are 1st checked using published mean activity coeffs. of HCl and NaCl and then for redox equil. of Pu. For the $\text{PuO}_2^{2+}/\text{PuO}_2^+$ couple and for the $\text{Pu}^{4+}/\text{Pu}^{3+}$ couple. The small discrepancy between the numerical values of entropy changes deduced from electrochem. and calorimetric techniques are discussed for actinides redox couples.

measured.
CO₂-bal,
So, Cp

(H) ~~A~~

C.A. 1995, 122, N18

$\text{PuO}_2^{2+}/\text{PuO}_2^+$

Pu(III)
Am(III)

[95 NOV/CRA]

1995

Novak C.F., Grafts C.C., Dheoge N.J.,
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Report - SAND-95-2010C, 1995, 17 page.

Pu(III) - Pu(VI) [96 PER/KIZY] 1996.

Petrushkin V. F., Kuyutchev S. V.,
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Pu³⁺
Pu⁴⁺
PuO₂²⁺

[98CON/A2M]

1998.

Conradson S.D., Al Mahamid I,
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Qu(III)
An(III)

[2000 AZZ/BUC]

2000

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Pu^{+3}
 Pu^{+4}

[2000 DAV/Fore]

2000

David F, Fourest B, Hubert S,
Pierans J., Vokhmer V, Melic C.,
,, Thermodynamic properties of Pu^{3+}
and Pu^{4+} aquo ions[†], Plutonium-
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Transactions, Santa Fe, NM, USA
10-13 July. p. 338. 2000

Pu^{3+}

Lemire R.J. et al.

2001

Chem. Thermodynamics of Np and Pu.

p. 55. Amsterdam et al. Elsevier, 2001

$$\Delta_f G_{298}^{\circ} = (-578,984 \pm 2,688) \text{ kJ} \cdot \text{mol}^{-1}$$

$$\Delta_f H_{298}^{\circ} = (-591,780 \pm 1,964) \text{ kJ} \cdot \text{mol}^{-1}$$

$$S_{298}^{\circ} = (-184,510 \pm 6,154) \text{ J} \cdot \text{K}^{-1} \cdot \text{mol}^{-1}$$

Pu⁴⁺

Lemire R.J. et al

2001

Chem. Thermodynamics of Np and Pu.
p.55. Amsterdam et al. Elsevier, 2001.

$$\Delta_f G^\circ_{298} = (-477,988 \pm 2,405) \text{ kJ mol}^{-1}$$

$$\Delta_f H^\circ_{298} = (-539,895 \pm 3,103) \text{ kJ mol}^{-1}$$

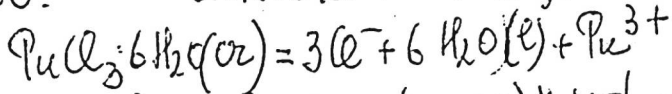
$$S^\circ_{298} = (-414,535 \pm 10,192) \text{ J K}^{-1} \text{ mol}^{-1}$$

Pu^{3+}

Lemire R. J. et al.

2001

Chemical Thermodynamics of Np and Pu.
p. 60. Amsterdam et al., Elsevier, 2001



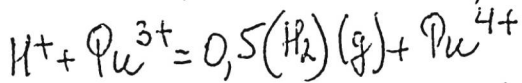
$$\Delta_f S_{298}^\circ = (-15,010 \pm 3,533) \text{ J} \cdot \text{K}^{-1} \cdot \text{mol}^{-1}$$

Pu^{4+}

Zemire R. J. et al.

2001

Chemical Thermodynamics of Np and Pu.
p. 60. Amsterdam et al., Elsevier, 2001



$$\Delta_r S_{298}^\circ = (-164,685 \pm 8,124) \text{ J} \cdot \text{K}^{-1} \cdot \text{mol}^{-1}$$

Pu(IV)
Pu⁴⁺

[2001NEC/KIM]

2001

Neck V., Kim H. T.,
"Solubility and hydrolysis of
tetravalent actinides"

Radiochim Acta 2001, 89, 1-16