

Tm - 120

Tu-201cyll62

9933 (IS-331) HEAT CAPACITY AND MAGNETIC
SUSCEPTIBILITY OF THULIUM ETHYLSULFATE.

1960

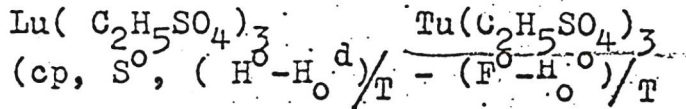
Bernard Clemence Gerstein and F. H. Spedding (Ames Lab.,
Ames, Iowa). Aug. 1960. Contract W-7405-eng-82. 161p.

The magnetic heat capacity and the single crystal mag-
netic susceptibilities of TmE.S. were measured in the range
12 to 300°K and 1.4 to 200°K, respectively. The magnetic
heat capacity of LuE.S. is measured to evaluate the lattice
contribution to TmE.S. Two maxima were observed in the
magnetic heat capacity at 19 and 80°K. The magnetic heat
capacity and susceptibilities were calculated using the
crystalline field approximation and two different sets of
crystalline field constants. In neither case was close agree-
ment obtained between theory and experiment, although the
calculated and experimental perpendicular susceptibilities
were in agreement. It is not obvious whether the lack of
good agreement between experiment and theory is a result
of a poor choice of crystal field parameters, a complete
failure of the crystal field approximation in this case, or a
breakdown of the assumptions involved in calculating the
term intervals and splittings for trivalent Tm. (auth)

Cp

NSA-1962-

-16-9



Gerstein B.C., Jennings L.D., Spedding F.H.,
 J.Chem.Phys., 1962, 37, N 7, 1496-1508
 Thermal and magnetic study of crystal
 field splitting in thulium ethylsulfate

PQ.

1963, 6E557

2276 P.K.
 B

1962

A-364

La³⁺, Ce³⁺, Pr³⁺, Nd³⁺, Sm³⁺, Eu³⁺, Gd³⁺, Tb³⁺, Dy³⁺
Ho³⁺, Er³⁺, Tm³⁺, Yb³⁺, Lu³⁺, Y³⁺, Cu²⁺, Zn²⁺, Cd²⁺, Pd²⁺
— ацетатные комплексы

Kolatz R.S., Powell J.E.,

Inorganic Chemistry,

1962, 1, №2, 293-296

10

Резх, 1963, А5В92

еего оригинал

1963

VIII 2635

Комплексы La, Ce, Pr, Nd, Sm, Eu, Gd,
 Tb, Dy, Ho, Er, Tm, Yb, Lu, Y c $O(CH_2COOH)_2$
 $Na O(CH_2CO)_2$ (ΔH_f , ΔG , ΔS)
 (ΔH_{aq})

Grenthe I.,

Acta chem. scand., 1963, 17, 2487-2498

July 1963

VIII 2634

1964

Каммехен La, Ce, Pr, Nd, Sm, Pm,
Eu, Gd, Tb, Ho, Dy, Er, Tm, Yb, Y, Lu
с CH_3COOH и $\text{O}(\text{CH}_2\text{COOH})$
(Kp)

Green the I.,

Acta chem. scand., 1964, 18, 293-299.

July 1964

1964

A - 641

Komplexes / La, Ce, Pr, Nd, Sm, Eu,
 $e M(CH_2COOH)_3$ { Gd, Tb, Dy, Ho, Er, Tm,
 Yb, Lu, Y
 (ΔH , ΔG° , ΔS°)

Prandiere P.L.E. de la, St. Meley L.A.,
 J. Inorgan. and Nucl. Chem.,
 1964, 26, 110, 1713-1719
 Jus [20]

VIII 2927

1965

$Me(NEO)_3$, где $M = La, Pr, Nd, Sm,$
 $Eu, Gd; Tb, Dy, Ho$
 $Me(NEO)_3 \cdot nH_2O$, M — редкозем. эл.
 $Se(NEO)_3 \cdot 0,2H_2O$ (о Hf)

Титовцев В.Е., Шкловер Л.П.,
 Шкальникова Л.М., Кузнецова Г.П.,
 Нагоредина Г.В.

Докл. АН ССР, 1965, 160, 366-369

РЖХ, 1965, 12 В 33

М

есть ср.к.

P33

VIII - 2/24

1965

Formation of heavy lanthanides. L. P. Shklover, V. E. Plyushchev, G. P. Kuznetsova, and T. A. Trushina. *Zh. Neorgan. Khim.* 10(5), 1121-5(1965)(Russ); cf. *CA* 62, 6138a. $M(HCO_2)_3 \cdot 2H_2O$, $M = Tm, Yb, \text{ and } Lu$, were prepd., for the 1st time, by dissolving $M(OH)_3$, obtained by pptg. from the nitrate with NH_4OH , in $HCOOH$ and drying to const. wt. at room temp. The d., detd. in C_6H_6 at 20° , of the Tm, Yb, and Lu compds. was 3.17, 3.119, and 3.058 and the standard heats of formation of the compds. dehydrated at 90° was -440.9 , -430.2 , and -435.7 kcal./mole, resp. At 200° decompn., which proceeded through $M_2O_3 \cdot CO_2 \rightarrow M_2O_3$, began. The stability of the compds. decreased in the order $Tm > Yb > Lu$. The soly. in H_2O at $25-50^\circ$ increased in the order $Er < Tm < Yb < Lu$. GBJR

 $Ln(HCO_2)_3 \cdot 2H_2O$ $Ln = Tm, Yb, Lu$ ΔH_f

+2

C.A. 1965-63-3

2604a



VIII 229 $\text{La}(\text{C}_2\text{H}_5\text{SO}_4)_3$; $\text{Ce}(\text{C}_2\text{H}_5\text{SO}_4)_3$; 1966-
 $\text{Pr}(\text{C}_2\text{H}_5\text{SO}_4)_3$; $\text{Nd}(\text{C}_2\text{H}_5\text{SO}_4)_3$; $\text{Sm}(\text{C}_2\text{H}_5\text{SO}_4)_3$;
 $\text{Eu}(\text{C}_2\text{H}_5\text{SO}_4)_3$; $\text{Yb}(\text{C}_2\text{H}_5\text{SO}_4)_3$; $\text{Dy}(\text{C}_2\text{H}_5\text{SO}_4)_3$;
 $\text{Mo}(\text{C}_2\text{H}_5\text{SO}_4)_3$; $\text{Er}(\text{C}_2\text{H}_5\text{SO}_4)_3$; $\text{Tm}(\text{C}_2\text{H}_5\text{SO}_4)_3$;
 $\text{Yb}(\text{C}_2\text{H}_5\text{SO}_4)_3$; $\text{Lu}(\text{C}_2\text{H}_5\text{SO}_4)_3$; $\text{Y}(\text{C}_2\text{H}_5\text{SO}_4)_3$;
 $(\text{OH} \text{aq})$ Staveland L. St. R., Markham D. R.,
 None S. L. R., Nature (Engl.), 1966,
 211, N5054, 1172-73

PX 1967
 165665

sums
 open

Is

VIII 229

BQ-4004-VIII

1966

~~Tu Co~~

Lemaire R.

Tm Co

Cobalt, 1966, n 82
182-140

Ttr

PM 1967 12212

$\text{Eu}(\text{C}_2\text{O}_4)^+$, $\text{Eu}(\text{C}_2\text{O}_4)_2^-$, $\text{Eu}(\text{C}_2\text{O}_4)_3^{3-}$ V III 630/1967
 $\text{Tu}(\text{C}_2\text{O}_4)^+$, $\text{Tu}(\text{C}_2\text{O}_4)_2^-$, $\text{Tu}(\text{C}_2\text{O}_4)_3^{3-}$ (Кр)

Андреева З.Ф., Безуглова В.Н., Колосов И.В.,
Шевцова З.Н.

Изв. Тимирязевск. с.-х. акад., 1967, №6, 200-206

Изучение комплексообразования европия и
туляния с оксалат-ионами в водном ионном
обмене.

РИИ Лом., 1968
12 В 62

Зу (ср) 9

Tm(C₂H₅SO₄)₃ n sp. VIII 755 1968

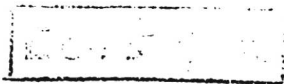
ΔHag

Staveley L.A.K., Markham D.K.,
Jones M.R., J. Inorg. and Nucl.
Chem., 1968, 30, n1, 231-240.

M, B

Tu C (Do, ΔH_{298}°) u ep. VIII 2016
1969

Gingerich K.A.,
J. Chem. Phys., 1969, 50, v5,
2255-2256



M, 10,

Sm C₂ (Tb); Tm C₂ (Tb) (ΔH_{f298}°) 8 1969
Pever R. L., Eick H. A., VIII 4332
U.S. At. Energy Comm., 1969, COO-
- 716-55, 12 pp (am.)

Vapor pressure measurements
in the samarium carbide-
- carbon and thulium carbide-
- carbon sys. terms.
MCP 7 CA, 1971, 74, N8, 35206

Оксикарбиды лантанидов (пермод. 1970
св-ва)

Butcheris A.D., VIII 4311
Diss. Abstr. Int., 1970, B30, N 11,
4956-57

МБ (9)

см. опр

с.а. 1971.

$TmC_2(s)$

Seiber R. Z.,

1970

Sick H. A.

U.S. At. Energy Comm.

1969, COO-41655, 12.

Avail. Rep. CNSTI. From Nucl.
Sci. Abstr. 1970, 24, 10, 19494.

ΔH_f

● $(Cu. SmC_2)I$

VIII 4370 YC_2 , LaC_2 , CeC_2 , RuC_2 , NdC_2 , 1970
 SmC_2 , GdC_2 , TbC_2 ; DyC_2 ; ZrC_2 ; TuC_2 ;
 La_2C_3 ; Ce_2C_3 ; Nd_2C_3 (Tm).

Юнко В. А., Макаренко Г. Н.,
Падерно Ю. Б.,
В. С. "Миротавр. карбиди",
Киев, Наук. думка, 1970, 148-54

б

(9)

Р. X. 71

TmC_2

Seiver, Robert L.

1971

$\Delta H_v, \Delta S_v$

From Diss. Abstr. Int.

B 1972, 32 v9, 5089.

(on SmC_2 , I)

$\text{SmC}_2, \text{TmC}_2$ (ΔH°_{f298}) 8 VIII 5174 1971

Seiver R. L., Eick H. A.,

High Temp. Sci. 1971, 3, N4, 292-9
(ann.)

Vapor pressure measurements
in the samarium dicarbide-
carbon and thulium dicarbide-
carbon systems.

U.S. (9) 7 CA, 1971, 75, N20, 122103m

$\text{La C}_2\text{H}_3(\text{OH})_2^{2+}$; $\text{Ce C}_2\text{H}_3(\text{OH})_2^{2+}$; $\text{Pr C}_2\text{H}_3(\text{OH})_2^{2+}$
 $\text{Nd C}_2\text{H}_3(\text{OH})_2^{2+}$; $\text{Sm C}_2\text{H}_3(\text{OH})_2^{2+}$; $\text{Eu C}_2\text{H}_3(\text{OH})_2^{2+}$
 $\text{Gd C}_2\text{H}_3(\text{OH})_2^{2+}$; $\text{Tb C}_2\text{H}_3(\text{OH})_2^{2+}$; $\text{Dy C}_2\text{H}_3(\text{OH})_2^{2+}$
 $\text{Ho C}_2\text{H}_3(\text{OH})_2^{2+}$; $\text{Er C}_2\text{H}_3(\text{OH})_2^{2+}$; $\text{Tm C}_2\text{H}_3(\text{OH})_2^{2+}$;
 $\text{Lu C}_2\text{H}_3(\text{OH})_2^{2+}$ (Kp) VIII 5415

Maikar Gurcharan Singh, Chadha
 Ramesh Chander, J. Inorg. and Nucl.
 Chem., 1972, 34, N1, 357-59

B (Kp)

PX 7-2

$TmCl_2$

1973

(T_{tr})

McColm, I.J., et al
J. Inorg. Nucl. Chem.
1973, 35, N6, 1931-40.

(cur. $SmCl_2$; I)

4M (C₂H₃O₂)₃ · 5C₃(NH₂)₂ · xH₂O 1973

IV (C₂H₃O₂)₃ · C₃(NH₂)₂ · xH₂O (Tm) VIII 5498

M = Tb, Dy, Ho, Er, Tm, Yb, Lu Y (x=1,2,4,6)

Сахарова Н.Н., Сахарова Ю.Т.,

Барисова Г.М.,

Дл. неорг. хим., 1973,

18, N5, 1212-14

5 (4)

ссть ф.к

РХ73

TmC₂

ommu 5601 1977

Male R.

Rev. Int. Hautes

(ΔHf)

Temp. Refract., 1977

14 / 179 - 92

Tim₂ CO

1978

Barnell A. Z.

currency
Rare Earths Mod. Sci.
and Technol. New York -
London, 1978, 297-301.

cell. C₂ CO-I

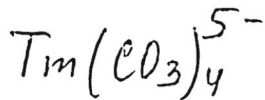
$Tm(CH_3COO)_3$ XVIII - 7288 1979

Баткиберова эл. и др.

(Δ Hsoln)

Ж. неорган. химии, 1979,
24, №11, 2983-85.

см. $Co(CH_3COO)_3 - I$



1979

Dumonceau Y; et al

C. r. Hebd. Seances

(Koopas)

Acad. Sci., 1979, C288
(15), 415.

● Erratum.

(err. $\text{La}(\text{CO}_3)_4^{5-}$; I)

1980

Lu₁₅C₁₉

кристал.
структ.

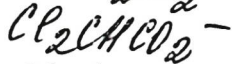
Bauer F., et al.,

C. r. Acad. sci., 1980, C90,
N20, 387-390.

(см. Y₅C₁₉; I)

Tm (III)

компл. соедин.



м. гун. св-ва

Оммуек 10781 1980.
Оммуек 14754
Ensoz D.D., et al.

J. Inorg. Nucl. Chem.,
1980, 42, 1477-80.

Тм-отаминские
соединения

1982

Павловой В.И.,

Термостабильный орган.

$\Delta H_f(K, M)$

соедин. переходных
металлов.

$\Delta_v H$

Авторизированная диссертация
на соискание ученой
степени д.х.н., Москва, 1982.



1985

Firsching F. H.,
Mohammadzadeh J.

Kp, paemo- y. Chem. and Eng.
pseudocomb Data, 1985, 31, N1,
40-42.

(cor. $\text{Sc}_2(\text{CO}_3)_3$; I)

Cumena
C-Tm

1986

106: 163211r The C-Tm (carbon-thulium) system. Gschneidner, K. A., Jr.; Calderwood, F. W. (Ames Lab., Iowa State Univ., Ames, IA USA). *Bull. Alloy Phase Diagrams* 1986, 7(6), 563-4 (Eng). No phase diagram is available for the C-Tm system although some compds. and structural data are reported. Analogy with other systems is discussed. Crystal structures and lattice parameter data are given for some of the phases.

C. A. 1987, 106, N 20.

$Tm CO_3$

1988

Мзареулишвили Н.В., Натидзе В.П.

Синтез и исследование смешанных карбонатов тулия

// Изв. АН ГССР. Сер. хим. — 1988. — Т. 14, № 3. — С. 167–172.

Рез. груз., англ.

— — 1. Тулий, карбонаты двойные — Синтез и свойства. 2.

Празеодим, карбонаты двойные — Синтез и свойства.

№ 119158

УДК 546:543:667.656.264

18 № 7410

НПО ВКП 16.11.88

ЕКЛ 17.4

[om. 35220]

1989

Tm₂

Chandrasekhariak M.S.,

Tm₄

Bingerich K.A.,

Tm₂

Handbook on the Physics

(ΔH_f , Do) and Chemistry of rare
earths, vol. 12.

Edited by K.A. Gschneidner K.A.,

Jr., and Eyring L. Elsevier
Science Publishers B.V., 1989.

Tm C₂

1999

131: 21962d Standard enthalpies of formation of some thulium alloys by high temperature direct synthesis calorimetry. Menschel, S. V.; Kleppa, O. J. (The James Franck Institute, The University of Chicago, Chicago, IL 60637 USA). *J. Alloys Compd.* 1999, 285(1-2), 179-184 (Eng), Elsevier Science S.A.. The std. enthalpies of formation of some Tm alloys in the binary systems of Tm-X (where X=C, Si, Ge, Sn, B, Ga) have been detd. by high temp. direct synthesis calorimetry at 1373±2 K. The following values of ΔH_f° in kJ/mol of atoms are reported: $\text{TmC}_2 = -31.5 \pm 2.5$; $\text{TmSi} = -86.1 \pm 2.3$; $\text{Tm}_5\text{Si}_3 = -76.1 \pm 2.3$; $\text{TmSi}_2 = -64.9 \pm 2.8$; $\text{Tm}_5\text{Ge}_3 = -91.3 \pm 1.9$; $\text{Tm}_5\text{Sn}_3 = -72.8 \pm 2.1$; $\text{TmB}_2 = -30.6 \pm 3.0$; $\text{TmGa}_2 = -48.5 \pm 2.0$. The results are compared with earlier exptl. data, with available data for the corresponding compds. of neighboring lanthanide elements and with predicted values from the semi-empirical model of Miedema and co-workers [Niessen et al., *Calphad* 1983;7:51-70].

(ΔH°)

131

C.A., 1999, 131, N2