

C_2

C
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VIII - 3414

1969

54370e Dissociation energy of Ce_2 . Balducci, Giovanni; De Maria, Giovanni; Guido, Marcella (Univ. Roma, Rome, Italy). *J. Chem. Phys.* 1969, 50(12), 5424-5 (Eng). Peaks corresponding to Ce_2 mols. were identified in the mass spectra of Ce vapor at 2100-2400°K. on the basis of mass, isotopic distribution, intensity profile, and appearance potential (5.2 ev. for Ce_2^+ , 5.6 ev. for Ce^+). The dissociation energy of Ce_2 , D° , and ratio $\alpha = \Delta H^\circ_{\text{vap}}(\text{vaporization of Ce})/D^\circ(\text{Ce}_2)$ were detd. to be 65 kcal./mole and 1.55, resp., in good agreement with values predicted on the basis of dissociation energies of Sc_2 , Y_2 , and La_2 and the accepted correlation between dissociation energy and availability of low lying bonding states of the atoms.

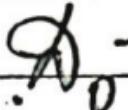
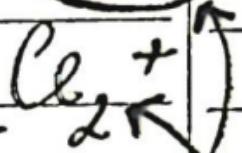
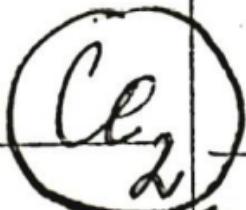
FBJN

C.A. - 1969

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1969

VIII - 34/14



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изд.

X. 1970. 4

4 Б111. Энергия диссоциации Ce_2 . Balducci G., De Magia G., Guido M. Dissociation energy of Ce_2 . «J. Chem. Phys.», 1969, 50, № 12, 5424—5425 (англ.)

Исследованы масс-спектры паров Ce в интервале т-р 2100—2400° К; потенциалы появления Ce^+ и Ce_2^+ составляют $5,6 \pm 0,5$ и $5,2 \pm 0,5$ эв. Из соотношения интенсивностей ионов мономера и димера при разных т-рах определена энергия диссоциации молекулы Ce_2 (65 ± 5 ккал/моль).

Б. В. Рассадин



VIII - 3914

1969

C₂

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12 Д96. Энергия диссоциации Ce₂. Balducci G., De Maria G., Guido M. Dissociation energy of Ce₂. «J. Chem. Phys.», 1969, 50, № 12, 5424—5425 (англ.)

Металлический церий испарялся из кнудсеновской ячейки при т-рах 2100—2400° К. Масс-спектрометрич. анализ продуктов испарения позволил получить зависимость интенсивности ионных токов, соответствующих одноатомной и двухатомной компоненте, от т-ры, с помощью которой из термодинамич. соотношений вычислена энергия диссоциации молекулы Ce₂: D₀[°]=65,3±
±0,1 ккал/моль.

Г. А. Вомпе

09. 1969. 12Д

(e₂ (g.)

~~61894m~~ Mass-spectrometric determination of the dissociation energy of the diatomic cerium molecule and predicted stability of diatomic rare earth metals. Gingerich, Karl A. (Texas A and M Univ., College Station, Tex.). Chem. Commun. 1969, (1), 9-10 (Eng). The Ce₂ mol. was identified in the gas phase by the use of a mass spectrometer. The dissocn. energy was derivd. from the 3rd-law enthalpy of the isomol. reactions: Au₂(g) + Ce₂(g) = 2CeAu(g) and CeAu(g) + Ce(g) = Ce₂(g) + Au(g); the av. enthalpy is -48.4 ± 0.4 kcal./mole and 28.9 ± 0.6 kcal./mole, resp. and the dissocn. energy is 41.6 and 42.1 kcal./mole, resp. It was previously shown by G. Verhaegen, *et al.* (1962) that for elements with a similar electronic configuration, the values of the dimensionless α -parameter ($\alpha = \Delta H_v / D_0^\circ$, where ΔH_v = heat of vaporization and D_0° = heat of assocn.) are const. By assuming this relation holds for the rare-earth metals, the dissociation energies of the unknown diat. metals can be predicted (rare earth metal, D_0° given): Pr, 37; Nd, 33; Sm, 21; Eu, 18; Tb, 38; Dy, 27; Ho, 32; Er, 33; Tm 25 kcal./mole. CJJN

+9

C. A. 1969. Y0.1

18

1969
20 Б717. Масс-спектрометрическое определение энергии диссоциации молекулы Ce_2 и оцененная устойчивость двухатомных молекул редкоземельных металлов.
Gingerich Kагl A. Mass-spectrometric determination of the dissociation energy of the molecule Ce_2 and predicted stability of diatomic rareearth metals. «J. Chem. Soc.», 1969, D, № 1, 9—10

Для изомолекулярных реаций $\text{Au}_2(\text{г.}) + \text{Ce}_2(\text{г.}) = 2\text{CeAu}(\text{г.})$ и $\text{CeAu}(\text{г.}) + \text{Ce}(\text{г.}) = \text{Ce}_2(\text{г.}) + \text{Au}(\text{г.})$ масс-спектрометрическим методом определены константы равновесия в интервале 2086—2217° К. Комбинация полученных констант равновесия с оцененными молекулярными постоянными $\text{Ce}_2(\text{г.})$ (электронная вырожденность —3, $\omega_e = 119 \text{ см}^{-1}$, $r_e = 3,29 \text{ \AA}$) дает для молекулы Ce_2 величину энергии диссоциации, $D_0^0 = 41,8 \pm 6 \text{ ккал/моль}$. На основании измеренной величины оценены энергии диссоциации двухатомных молекул следующих редкоземельных элементов (ккал/моль): Pr , 37; Nd , 33; Sm , 21; Eu , 18; Tb , 38; Dy , 27; Ho , 32; Er , 33; Tm , 25. А. Гусаров

д. 1969.

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Ce₂

Karl A. Gingerich

1969

840

(t_{bo}°)

"J. Chem. Phys"

1969, 50, N5, 2255-56

Ce₂

Omniweek 4639

1970

Gingerich R. A. ugg

(do)

Proceedings 8th

Rare Earth Res. Conf.

April, 19-22, Reno, Nevada

Vol II; 472 - 481

Ce_2

Марханекеев
Г.И.

1970

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не фх

Φ_0

44, №2, 325

(Ce_2 . Ft_2) III

CeAu, (ΔH), Ce_xLaAu, 1971

CeAu, PrAu, NdAu (Do) 8

VIII 4393

ommm. 4605

Gingerich K.B., Finnigan H.C.

J. Chem. Phys. 1971, 54, N6, 2621-2625 (nm)

Dissociation energy of diatomic cerium
and predicted stability of gaseous inter-
metallic cerium compounds

14

PLA 1971



165741

M, 10 ⑨

Ce₂

B9-5631-VIII

1972

Kant A, Lin S.S.

(20)

Monatsh Chem, 1972,
103, N3, 757-63

● (cum p33; I)

Ce-Ce

OTT 4824

1975

Kerr J. A., et al.

(8c)

Handbook Chem. Phys.,
55 th Ed., 1974-75.

Л2
10 м. 19228) 1984

(We, оценка) Goodfriend P. L.,
Spectrochim. acta,
1984, A 40, n3, 283 -
285.

F: Ce2

P: 3

133:288170 Absorption, excitation, and
resonance Raman spectra of Ce2, Pr2, and Nd2.

Shen, Xiaole; Fang, Li; Chen, Xiaoyu;
Lombardi, John R. Department of Chemistry and
Center for Analysis of Structures and Interfaces
(CASI), The City College of New York NY 10031, USA

J. Chem. Phys., 113(6), 2233-2237 (English)

2000, The authors report the absorption, resonance
Raman, and excitation spectra of mass selected Ce,
Pr, and Nd dimers in Ar matrixes. Absorption bands
were found for each sample. The excitation
profiles give more sensitive detail and resemble
absorption spectra. Resonance Raman spectra give
single progressions for which Ce2: $\omega_e = 245.4$

2000

\pm 4.2 cm⁻¹, Pr₂: $\omega_e = 244.9 \pm 1.2$ cm⁻¹, and
Nd₂: $\omega_e = 148.0 \pm 1.9$ cm⁻¹, $\omega_{exe} = 0.7 \pm 0.4$ cm⁻¹. Comparison among lanthanide dimers is
discussed.

~~Y_n~~

Ce_n

2001

$n < 40$

(y)

Δ

⑦ Ce_n

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135: 231934e Calculation of ionization potential of small yttrium and lanthanide metal clusters. Durakiewicz, T.; Halas, S. (Condensed Matter and Thermal Physics, Los Alamos National Laboratory, Los Alamos, NM 87545 USA). *Chem. Phys. Lett.* 2001, 341(1,2), 195–200 (Eng), Elsevier Science B.V. Our analytic formula for ionization potential (IP) of a metal cluster of given radius, R, is adapted to small size clusters with no. of atoms $n < 40$. The radius is defined as the distance between gravity center and the most remote atom surface. R was either calcd. or detd. exptl. with relative uncertainty of 3%. We have found that $R(n)$ significantly fluctuates around $1.30 n^{1/3}$ for $n < 40$. The calcd. IP values for Y_n and Ce_n small clusters indicate the valence transition from $Z=3$ to $Z=2$ at $n=6$ and 3, resp., whereas $Z=3$ may be considered for Pr_5 and perhaps for Pr_6 .

C.A. 2001, 135, N16