Окислы – Zn

МО

1944

Окислы редкоземельных элементов

(D_0)

57405y Rare earths. IV. Dissociation energies of the gaseous monoxides of the rare earths. L. L. Ames, P. N. Walsh, and David White (Ohio State Univ., Columbus). *J. Phys. Chem.* 71(8), 2707–18(1967)(Eng); cf. *CA* 56: 1006b. The dissocn. energy of the gaseous rare earth monoxides together with the closely related compds. ScO and YO have been detd. from Knudsen effusion and mass spectrometric isomol. O-exchange reaction studies. There is a double periodicity in the variation of the dissocn. energies with at. no., and these variations closely match those of the heats of sublimation of the rare earth metals. Assuming a common bound state for the monoxides, $M^{2+}O^{2-}$, it is shown that the variations in the dissocn. energies in the lanthanide series correspond to the magnitude of the $4f^n \rightarrow 4f^{n-1}5d$ transitions of the divalent ions. 38 references.
RCKG

+2

C. A. 1967. 67. 12

☒

РЗЭ-окисл

ВФ-4314-VIII

1971

8 Д419. **Спектроскопия окислов редких земель в инертных матрицах при 4° К.** DeKock Roger L., Weltner William, Jr. Spectroscopy of rare earth oxide molecules in inert matrices at 4° K. «J. Phys. Chem.», 1971, 75, № 4, 514—525 (англ.)

Получены ИК-спектры поглощения окислов редких земель в матрицах из Ar и Ne при т-ре 4° К. Зарегистрированы колебательные частоты моноокисей всех редкоземельных элементов, кроме Yb и Eu в области 800—830 $см^{-1}$. Получены спектры двуокисей Ce, Pr, Tb, причем для CeO_2 и PrO_2 незначительная интенсивность полосы колебания ν_1 позволяет утверждать, что эти молекулы имеют почти линейную конфигурацию. Получены УФ- и видимые спектры поглощения моноокисей ред-

спектры в матрицах

ν_i, ω_e

Ф 1971 · 8Д

См. на об.

Н

☒

ких земель в области 8500—2000 Å и проведено сравнение со спектроскопич. данными для газовой фазы. Обнаружено излучение CeO_2 в области 5000—6000 Å с длительностью ~200 *мсек*, отнесенное к запрещенному синглет-триплетному переходу. Библ. 23. Ю. М. Л.

CeO_2; PrO_2; TbO_2
CeO; PrO; TbO, LaO
GdO; NdO, SmO,
DyO; HoO; ErO
TmO, LuO

Окислы 1973

лантанидов Gabelnick S.D.
et al.

28th Sympos. on molecular Spectrosc., Columbus, USA, 11-15 june, 1973, p 203.

Колеб. спектр и структура...

Окислы лантанидов

1973

Joergensen, Christian Klixbull.

(У)

„Chimia"
1973, <u>27</u> (4), 203-8.

(см. Галогениды галогениды; <u>III</u>)

Моноокиси

РЗ,Э

(70)

x 1975
N8

1974

(+2)

☒

8 Б837. Ионная модель и дипольные поляризуемости в энергетических расчетах. Энергии диссоциации моноокисей редкоземельных элементов и моноокисей и моносульфидов щелочно-земельных элементов. Guido M., Gigli G. Ion model and dipole polarizabilities in energy calculations. The dissociation energies of the rare—earth monoxides and the alkaline—earth monixides and monosulfides. «J. Chem. Phys.», 1974, 61, № 10, 4138—4140 (англ.)

На основании результатов расчетов, базирующихся на модели риттнеровского типа, доказана применимость модели поляризованного двойного иона для расчета основных св-в газ. моноокисей РЗЭ и сильно электроположит. моноокисей и моносульфидов щел.-зем. элементов. В частности показано, что рассчитанные значения энергий диссоциации моноокисей РЗЭ и моноокисей и моносульфидов щел.-зем. элементов хорошо согласуются с эксперим. Это подтверждает гипотезу, что поляризуемости, по меньшей мере как параметры, использованные в этом типе расчетов ионной модели, не зависят или почти не зависят от окружающей среды. В этой связи показана возможность установления шкалы поляризуемости для использования в расчетах ионной модели. В. Ф. Байбуз

LnO Ж4-14759 1976

1Д117. **Термодинамика ионизации газообразных окислов; первые потенциалы ионизации металлов из ряда лантаноидов и их окислов.** Ackermann R. J., Rauh E. G., Thorn R. J. The thermodynamics of ionization of gaseous oxides; the first ionization potentials of the lanthanide metals and monoxides. «J. Chem. Phys.», 1976, 65, № 3, 1027—1031 (англ.)

Первые потенциалы ионизации (ПИ) элементов из ряда лантаноидов и их окислов в газовой фазе определены по методу электронного удара из потенциалов появления на кривых эффективности ионизации. Измерения ПИ проводились при одновременном введении известных стандартов. Полученные ПИ для ряда лантаноидов хорошо согласуются со спектроскопич. данными и результатами исследований по методу поверхн. ионизации. В начале ряда лантаноидов наблюдается соотношение ПИ(Ln)>ПИ(LnO), тогда как в конце этого ряда выполняется обратное соотношение. Разница между этими величинами определяется разницей энергий диссоциации (D_0) нейтрального и однократно

(У)

Ф.1947.N1

ионизованного окислов LnO, благодаря чему получены величины $D_0(\mathrm{LnO}^+)$. Природа химич. связи в LnO и LnO^+ исследована исходя из электростатич. модели системы точечных зарядов. Для нейтральной молекулы приняты допущения о монотонном изменении межъядерного расстояния и параметра электростатич. отталкивания, а также о немонотонном изменении в ряду Ln энергии поляризации, которая определяется разностью энергий электронных переходов типа $4f^n$—$4f^{n-1}5d$. Эта же схема, за исключением последнего допущения, использована для определения энергий связи в LnO^+. Показано, что такая полуэмпирич. модель дает хорошее описание ионной связи в рассматриваемых соединениях: энергии диссоциации для гипотетич. процессов $\mathrm{LnO} \to \mathrm{Ln}^{+2} + \mathrm{O}^{-2}$ и $\mathrm{LnO}^+ \to \mathrm{Ln}^{+3} + \mathrm{O}^{-2}$ отличаются от величин, следующих из эксперимента, не более чем на 0,2 эв, за исключением случая Ln=La.

Г. А. Вомпе

60429.4315
TC,Ph

76237
Окислы РЗЭ

1976
4249

Colliex C., Gasgnier M., Trebbia P. Analysis of the electron excitation spectra in heavy rare earth metals, hydrides and oxides. "J.phys."(France), 1976,37,N 4, 397-406 (англ.,рез.франц.)

0606 [illegible]

588.590 597.

ВИНИТИ

Оксиды РЗЭ 1977

86: 146664s **Mass spectrometric observations of some polyatomic gaseous rare earth oxides and their atomization energies.** Kordis, J.; Gingerich, K. A. (Dep. Chem., Texas A and M Univ., College Station, Tex.). *J. Chem. Phys.* 1977, 66(2), 483-91 (Eng). From Knudsen effusion mass spectrometric examn. of reactions of the type $M(g) + MO(g) = M_2O(g)$, $2MO(g) = M_2O_2(g)$, and $2MO(g) = MO_2(g) + M(g)$, the atomization energies $\Delta H°_0$ (kcal/mole) of the following new species were estd.: $Eu_2O(g)$, 174 ± 12; $Gd_2O(g)$, 236 ± 10; $Tb_2O(g)$, 243 ± 12; $Ho_2O(g)$, 216 ± 14; $Lu_2O(g)$, 266 ± 14; $Eu_2O_2(g)$, 324 ± 17; $Gd_2O_2(g)$, 427 ± 17; $Tb_2O_2(g)$, 432 ± 21; $Ho_2O_2(g)$, 407 ± 26; $GdO_2(g)$, 314 ± 17; and $HoO_2(g)$, 307 ± 25. Atomization energies $\Delta H°_0$ (kcal/mole) revised from literature are presented for the following; $Sc_2O(g)$, 236 ± 16; $Y_2O(g)$, 249 ± 13; $La_2O(g)$, 265 ± 13; $Y_2O_2(g)$, 438 ± 28; $La_2O_2(g)$, 459 ± 28; $Ce_2O_2(g)$, 472 ± 15; CeO_2 (g), 344 ± 5; and $NdO_2(g)$, 318 ± 20. The variation of the atomization energies of the $M_2O(g)$, $M_2O_2(g)$, and $MO_2(g)$ species along the lanthanide series follows a similar pattern obsd. for the atomization energies of the MO(g) species and the heat of sublimation of the corresponding metals. Predictions of the atomization energies of the yet unobsd. rare earth oxide species of the types above have been made. The std. heats of formation at 0 K of the gaseous rare earth oxides are also presented.

Энергия атомиз.

С.А. 1977, 86 N20

LnO 1978

Ackermann R.J; Rauh E.G.

(Do)

Rev. Int. hautes temp. et refract., 1978, <u>15</u> (3), 259-80

(cu. LnO; <u>I</u>)

Окисле редкоземелн. элементов

1982

2Д463. Электронная структура двухатомных молекул без простых молекулярных постоянных. Diatomic molecule electronic structure beyond simple molecular constants. Field Robert W. «Ber. Bunsenges. phys. Chem.», 1982, 86, № 9, 771—779 (англ.)

Разработана полуэмпирич. теория, позволяющая существенно упростить построение энергетич. диаграмм молекул, содержащих атомы с частично заполненными оболочками 3*d* и 4*f*. На примере семнадцати двухатомных окислов редкоземельных элементов показано, что применение этой теории позволяет интерпретировать их спектры, несмотря на высокую плотность низколежащих электронных состояний. Отмечено, что в рамках предложенного подхода возможны детальная численная параметризация и количеств. предсказание положения уровней, расчет матричных элементов возмущения и интенсивностей переходов. Библ. 25.

М. Т.

Ei.

Ф. 1983, 18, N 2

LnO
CeO и др.
Низколежащ.
эл. уровни

Ln-лантаноиды
(кроме EuO, YbO).
CeO

(У Кузнецова) 1983

Душин Р.Б., Щерба Л.Д.;

Происхождение низколежащих электронных уровней молекул LnO.

Тезисы докладов XIX Всесоюзного Съезда по спектроскопии, Томск, 1983.

LnO-
лантаноид.
(кроме
EuO, YbO)

(у Куликова) 1983

Душин Р.Б., Щерба Л.Д.,
Происхождение низколежащих
электронных уровней молекул LnO.

Тезисы докл. XIX Всесоюзного съезда по спектроскопии,
Томск, 1983.

LnO

1986

Ln – лантанид

105: 50062d **Thermochemical properties of the rare earth monoxides.** Dulick, M.; Murad, Edmond; Barrow, R. F. (Air Force Geophys. Lab., Hanscom Air Force Base, MA 01731 USA). *J. Chem. Phys.* 1986, 85(1), 385–90 (Eng). Crystal-field theory was used to identify and locate the energy levels of low-lying (<10,000 cm^{-1}) states of the rare earth monoxides. These states were used to calc. the thermal functions, which were then used to derive accurate dissocn. energies of the rare earth monoxides. These newly derived dissocn. energies are discussed in terms of a model related to the promotion energies for $4f^{n+1}5d^0 \rightarrow 4f^n5d^1$.

низкие возб. состоян.

С. А. 1986, 105, N6

Соединения лантанидов

От. 24793

1986

Губанов В.А., Рыжков М.В.,

(химич. связь)

Ж. структур. химии, 1986, 27, № 5, 123 – 135.

Химические связи в соединениях лантанидов.

Ln

1986

105: 160941x **High resolution, mass resolved spectra of rare isotopes.** Miller, C. M.; Engleman, R., Jr.; Keller, R. A. (Los Alamos Natl. Lab., Los Alamos, NM 87545 USA). *AIP Conf. Proc.* **1986,** 146(Adv. Laser Sci. – 1), 642–5 (Eng). A review with 4 refs. of recent results on resonance-ionization mass spectrometric measurement of high-resoln. optical spectra of Ln rare isotopes. Hyperfine spectra of the $^{2}D^{0}_{3/2}$, $^{2}D_{3/2}$ transition at 22,125 cm^{-1} were obtained for ^{173,176}Lu.

(спектр изотопн.)

C. A. 1986, 105, N18

LnO

1986

Ln-ланта-
ноид

(оценка
м.п.)

5Б1101 Деп. Оценка молекулярных постоянных двухатомных молекул лантаноидов. Тюлин В. И., Ерохин Е. В.; Ред. ж. «Вестн. МГУ. Химия». М., 1986. 17 с., ил. Библиогр. 19 назв. Рус. (Рукопись деп. в ВИНИТИ 23.09.86, № 6804-В)

На основе предложенных эмпирич. закономерностей рассчитаны частоты колебаний и межъядерные расстояния основного электронного состояния двухатомных окислов и галогенидов лантаноидов. Автореферат

(41) ☒

LnX, где
Ln- лантаноид,
X - галоген

Х.1987, 19, N5

Лантани- От. 25122 1986.
ды (ионы)

Vanquickenborne L. G., Pierloot K., et al.,

электрон-
состоян.
структура

Inorg. Chim. Acta, 1986, <u>120</u>, N2, 209-213.

Окислы редких земель

1987

108: 228531h **Laser spectroscopy of rare earth oxides.** Linton, C. (Phys. Dep., Univ. New Brunswick, Fredericton, NB Can. E3B 5A3). *J. Phys., Colloq.* 1987, (C7), C7-611/C7-615 (Eng). Recent developments in the spectroscopy of the rare earth oxides using laser techniques are reviewed with 15 refs. A ligand field theor. approach describing the electronic states is outlined along with the various exptl. techniques that have been used as diagnostic tools to test various aspects of the theory. Results for several mols. are outlined.

(лазерная спектроскоп.)

C.A. 1988, <u>108</u>, N26

Моногидрид РЗМ

1989

10 Д130. Изучение моногидридов, монооксидов и монофторидов редкоземельных металлов методом псевдопотенциала. Pseudopotential study of the rare earth monohydrides, monoxides and monofluorides / Dolg M., Stoll H. // Theor. chim. acta.— 1989.— 75, № 5.— С. 369—377.— Англ. Место хранения ГПНТБ СССР

Развитый в предыдущей статье (// Theor. chim. acta.— 1989.— 75.— С. 173) квазирелятив. метод псевдопотенциалов, зависящих от энергии, применен для расчета атомных свойств 3 групп соединений металлов от La до Lu. Параметры псевдопотенциала выбирались для трех- и двухвалентных конфигураций $4f$-атомов. Приведенные результаты для длин связей, энергий диссоциации и характерных колебательных частот позволяют заключить, что метод удовлетворительно воспроизводит наблюдаемые тенденции, однако для получения количественно точных результатов, вероятно, необходимо включить $4f$-состояния в число валентных. Обсуждается роль релятив. поправок. Библ. 78.

А. Б.

расчет атом.
св-в методом
псевдопотенци-
ала

(42)

ф. 1989, N10

Монооксиды, моногидриды и монофториды редких земель

1989

111: 45559r Pseudopotential study of the rare earth monohydrides, monoxides and monofluorides. Dolg, M.; Stoll, H. (Inst. Theor. Chem., Univ. Stuttgart, D-7000 Stuttgart, 80 Fed. Rep. Ger.). *Theor. Chim. Acta* 1989, 75(5), 369-87 (Eng). Nonrelativistic and quasirelativistic energy-adjusted pseudopotentials for fixed 4f subconfigurations of the rare earth elements La through Lu together with corresponding optimized valence basis sets were used in SCF and CI(SD) calcns. to det. the spectroscopic consts. for the energetically low lying superconfigurations of the lanthanide monohydrides, monoxides, and monofluorides. The exptl. obsd. trends in dissocn. energies, bond lengths, and vibrational frequencies for the ground states of the calcd. superconfigurations of the monoxides and monofluorides are well reproduced. The results for the monohydrides are mainly predictions.

м.п. эле
~~нетр~~ корасп-сел,
теор. расчет)

С.А. 1989, 111, №6

M_2

1989

M - Редкие земли

111: 30746a **Multichannel Rydberg spectra of the rare gas dimers.** Du, Ning Yi; Greene, Chris H. (Dep. Phys. Astron., Louisiana State Univ., Baton Rouge, LA 70803 USA). *J. Chem. Phys.* 1989, 90(11), 6347-60 (Eng). Rydberg levels of several heteronuclear rare gas dimers are treated theor. by combining multichannel quantum defect methods with a nonperturbative Fermi-type anal. Calcns. confirm many major spectral features obsd. in expts. by Dehmer and Pratt, and permit the first detailed interpretation and classification of some of the obsd. spectra. The dimer spectra closely resemble at. spectra in many cases, while others show dramatic mol. effects.

(Ридберг-серии)

C.A. 1989, 111, N4

Лантанидное сжатие 1989

112: 25863c Atomic-like orbits and lanthanide contraction. Li, Yongping; Xia, Shangda; Zhang, Haifeng (Dep. Phys., Univ. Sci. Technol. China, Hefei, Peop. Rep. China). *Chin. Phys. Lett.* 1989, 6(10), 436-9 (Eng). The high order momentums of radial wave functions for 4f-series were calcd. using at.-like Gaussian basis. The lanthanide contraction and some comparisons are discussed.

C.A. 1990, 112, N4.

Оксиды
РЗЭ

1989

Linton C., Bujin G.,
et al.,

Laser Spectroscopy of Rare
Earth Monoxides: Recent
Results.
Eleventh Colloquium On
High Resolution Mole- 26

cular Spectroscopy, Giessen,
September 18-22, 1989, A1, F26.

Окисли лантанідів 1989

Электронная структура

111: 140692n Electronic structure and physical-chemical properties of lanthanide oxides. Rizhkov, M. V.; Khodos, M. Ya.; Teterin, G. A.; Gubanov, V. A. (USSR). *Visn. Akad. Nauk Ukr. RSR* 1989, (5), 36–49 (Ukrain). A review with 32 refs.

C.A. 1989, 111, N16

ZnO Om. 36340 1991

Cockett M.C.R., Nyulás-
zi L., et al.,

(D_0, ΔH, I) J. Electron. Spectrosc.
and Relat. Phenom. 1991,
57, N3-4, ● 373-397

Окислы
лантанидов
<u>LnO</u>

1997

Karachevtsev G.V.,

<u>Zh</u>. Fiz. Khim. 1997,
<u>71</u> (4), 755–757

I, D_0,
ареалы
отношен.

(см. ● TiO, <u>III</u>)

LnX ? 1999

X=O, S, F, Cl, Br, I

Ln = La - Lu

(D^0_0, I)

130: 215148t Thermochemical properties (D°_0 and IP) of the lanthanide monohalides. Kaledin, Leonid A.; Heaven, Michael C.; Field, Robert W. (Department of Chemistry, Emorv University, Atlanta, GA 30322 USA). *J. Mol. Spectrosc.* 1999, 193(2), 285–292 (Eng), Academic Press. Thermochem. data for the lanthanide monohalides were combined with recent ligand field theory calcns. (K. et al., 1996) to est. the dissocn. energies and ionization potentials for all LnX (Ln = Ba–Lu, and X = F, Cl, Br, I) and the dissocn. energies for LnX^+. Owing to the negligible involvement of the core–like 4f electrons in bonding, the dissocn. energies and ionization potentials of all LnX (Ln = Ba–Lu, X = O, S, F, Cl, Br, I) should vary with Ln atom in a simple linear manner, provided that corrections are made for differences in f–orbital occupancy between LnX and the free Ln atom or between LnX and LnX^+. Such a model is provided, and, in so doing, several inconsistencies in the thermochem. data are cor. Based on thermochem. data (Kitaev, A.A., et al., 1996) and recent spectroscopic observations (McCarthy, M.C., et al., 1996), a revised value for the ionization potential of DyF, IP(DyF) = 5.85 ± 0.06 eV, is proposed. (c) 1999 Academic Press.

+?

C.A. 1999, 130, N16

LnX

LnX^+

$X = F, Cl, Br, I$

$Ln = La - Lu$

(D_0, I)

1999

Kaledin L. A.; Heaver, Michael C; et al.,

J. Mol. Spectrosc. 1999, 193(2), 285-292.

(см. LnO ● ; III)

$(ZnO)_2$ DM-40153 1999

Stephen P. Willson
and Lester Andrews*
J. Phys. Chem. A1999,
103, 6972-83

ИК спектр
в
матрице
тв. Ar

ZnO
ZnO^{+}
ZnO^{-}

От. 40153

1999

Stephen P. Willson
and Lester Andrews[†],

ИК спектр
в матрице
тв. Ar

J. Phys. Chem. A 1999,
103, 6972-83.

LnO_2
LnO_2^-

Om. 90153

1999

Stephen P. Willson
and Lester Andrews*

ИК
спектр
в
матрице
тв. Ar

J. Phys. Chem. A1999,
103, 6972-83

LnO_3^-

ОМ · 40153

1999

ИК спектр
в
матрице
тв. Ar

Stephen P. Willson
and Lester Andrews$^+$,

J. Phys. Chem. A1999,
103, 6972-83

F: (LnO)2 40155 См. 40253 1999
P: 3

131:10919 Characterization of the Reaction Products of Laser-Ablated Early Lanthanide Metal Atoms with Molecular Oxygen. Infrared Spectra of LnO, LnO+, LnO-, LnO2, LnO2+, LnO2-, LnO3-, and (LnO)2 in Solid Argon. Willson, Stephen P.; Andrews, Lester (Chemistry Department, University of Virginia, Charlottesville, VA 22901, USA). J. Phys. Chem. A, 103(17), 3171-3183 (English) 1999 American Chemical Society. CODEN: JPCAFH. ISSN: 1089-5639. DOCUMENT TYPE: Journal CA Section: 73 (Optical, Electron, and Mass Spectroscopy and Other Related Properties) This paper is the 1st of a 2-part study of the reaction products of laser-ablated lanthanide metal atoms with O2. There is general agreement with previous gas-phase and matrix-

C.A. 2000

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F: LnO3- 40155 ана. 140553 1999

P: 3

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F: LnO- 40155 Шиф. 40153 1999
P: 3

131:10919 Characterization of the Reaction Products of Laser-Ablated Early Lanthanide Metal Atoms with Molecular Oxygen. Infrared Spectra of LnO, LnO+, LnO-, LnO2, LnO2+, LnO2-, LnO3-, and (LnO)2 in Solid Argon. Willson, Stephen P.; Andrews, Lester (Chemistry Department, University of Virginia, Charlottesville, VA 22901, USA). J. Phys. Chem. A, 103(17), 3171-3183 (English) 1999 [illegible]

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F: LnO2
P: 3

Om. 40353
От. 40155

1999

131:10919 Characterization of the Reaction Products of Laser-Ablated Early Lanthanide Metal Atoms with Molecular Oxygen. Infrared Spectra of LnO, LnO+, LnO-, LnO2, LnO2+, LnO2-, LnO3-, and (LnO)2 in Solid Argon. Willson, Stephen P.; Andrews, Lester (Chemistry Department, University of Virginia, Charlottesville, VA 22901, USA). J. Phys. Chem. A, 103(17), 3171-3183 (English) 1999 American Chemical Society. CODEN: and Other Related Properties). This paper is the 1st of a 2-part study of the reaction products of laser-ablated lanthanide metal atoms with O2. There is general agreement with previous gas-phase and matrix-isolated neutral monoxides of the lanthanide elements. The present results agree with earlier identifications of CeO2 and PrO2 and make new assignments for NdO2, SmO2,

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Om 40155 1.9.99

F: ~~LnO3~~, LnO, LnO^+, LnO^-, LnO_2^+, LnO_2^-
P: 3

131:10919 Characterization of the Reaction Products of Laser-Ablated Early Lanthanide Metal Atoms with Molecular Oxygen. Infrared Spectra of LnO, LnO+, LnO-, LnO2, LnO2+, LnO2-, LnO3-, and (LnO)2 in Solid Argon. Willson, Stephen P.; Andrews, Lester (Chemistry Department, University of Virginia, Charlottesville, VA 22901, USA). J. Phys. Chem. A, 103(17), 3171-3183 (English) 1999 This paper is the 1st of a 2-part study of the reaction products of laser-ablated lanthanide metal atoms with O2. There is general agreement with previous gas-phase and matrix-isolated neutral monoxides of the lanthanide elements. The present results agree with earlier identifications of CeO2 and PrO2 and make new assignments for NdO2, SmO2, EuO2, and GdO2. This work provides vibrational frequencies for 6 LnO+, 5 LnO-, 2 LnO2+, 6 LnO2-, and 2 LnO3- species; 5 (LnO)2 rings are also reported here for the 1st time. Low ionization energies for the metals and the LnO mols. facilitate prodn. of the LnO+ cations and make electrons available for capture to form mol. anions. The doping of CCl4 into these samples provides a diagnostic test for the identification of mol. cations and anions by matrix IR spectroscopy.

F: LnO+ ОТ 40155 ОМ 40153 1999
P: 3

131:10919 Characterization of the Reaction Products of Laser-Ablated Early Lanthanide Metal Atoms with Molecular Oxygen. Infrared Spectra of LnO, LnO+, LnO-, LnO2, LnO2+, LnO2-, LnO3-, and (LnO)2 in Solid Argon. Willson, Stephen P.; Andrews, Lester (Chemistry Department, University of Virginia, Charlottesville, VA 22901, USA). J. Phys. Chem. A, 103(17), 3171-3183 (English) 1999 American Chemical [illegible] This paper is the 1st of a 2-part study of the reaction products of laser-ablated lanthanide metal atoms with O2. There is general agreement with previous gas-phase and matrix-isolated neutral monoxides of the lanthanide elements. The present results agree with earlier identifications of CeO2 and PrO2 and make new

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F: LnO of40155 [illegible] 1999
P: 3

131:10919 Characterization of the Reaction Products of Laser-Ablated Early Lanthanide Metal Atoms with Molecular Oxygen. Infrared Spectra of LnO, LnO^+, LnO^-, LnO_2, LnO_2^+, LnO_2^-, LnO_3^-, and $(LnO)_2$ in Solid Argon. Willson, Stephen P.; Andrews, Lester (Chemistry Department, University of Virginia, Charlottesville, VA 22901, USA). J. Phys. Chem. A, 103(17), 3171-3183 (English) 1999

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1999

F: LnO2-
P: 3

131:249649 Characterization of the Reaction Products of Laser-Ablated Lat Lanthanide Metal Atoms with Molecular Oxygen: Infrared Spectra of LnO, Ln LnO-, LnO2, LnO2-, LnO3-, and (LnO)2 in Solid Argon. Willson, Stephen P.; Andrews, Lester

Chemistry Department, University of Virginia
Charlottesville, VA 22901, USA

J. Phys. Chem. A, 103(35), 6972-6983 (English) 1999

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1999

F: LnO3-
P: 3
131:249649 Characterization of the Reaction Products of Laser-Ablated Lat Lanthanide Metal Atoms with Molecular Oxygen: Infrared Spectra of LnO, Ln LnO-, LnO2, LnO2-, LnO3-, and (LnO)2 in Solid Argon. Willson, Stephen P.; Andrews, Lester
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F: LnO2
P: 3

1399

131:249649 Characterization of the Reaction Products of Laser-Ablated Lat Lanthanide Metal Atoms with Molecular Oxygen: Infrared Spectra of LnO, Ln LnO-, LnO2, LnO2-, LnO3-, and (LnO)2 in Solid Argon. Willson, Stephen P.; Andrews, Lester Chemistry Department, University of Virginia Charlottesville, VA 22901, USA J. Phys. Chem. A, 103(35), 6972-6983 (English) 1999 This paper is the 2nd segment of a study into the reaction products of laser-ablated lanthanide metal atoms with O2. There is general agreement previous gas-phase and matrix IR observations of neutral lanthanide monox the frequencies of monoxide cations and anions are original to this work. dioxide anion vibrational frequencies of all late lanthanides and neutral frequencies of 5 of the last 7 are reported. In conjunction with the ear part of this study, the av.

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F: (LnO)2
P: 3

1999

131:249649 Characterization of the Reaction Products of Laser-Ablated Lat Lanthanide Metal Atoms with Molecular Oxygen: Infrared Spectra of LnO, Ln LnO-, LnO2, LnO2-, LnO3-, and (LnO)2 in Solid Argon. Willson, Stephen P.; Andrews, Lester

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1999

F: LnO-
P: 3
131:249649 Characterization of the Reaction Products of Laser-Ablated Lat Lanthanide Metal Atoms with Molecular Oxygen: Infrared Spectra of LnO, Ln LnO-, LnO2, LnO2-, LnO3-, and (LnO)2 in Solid Argon. Willson, Stephen P.; Andrews, Lester Chemistry Department, University of Virginia Charlottesville, VA 22901, USA J. Phys. Chem. A, 103(35), 6972-6983 (English) 1999 This paper is the 2nd segment of a study into the reaction products of laser-ablated lanthanide metal atoms with O2. There is general

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1999

F: LnO+
P: 3
131:249649 Characterization of the Reaction Products of Laser-Ablated Lat Lanthanide Metal Atoms with Molecular Oxygen: Infrared Spectra of LnO, Ln LnO-, LnO2, LnO2-, LnO3-, and (LnO)2 in Solid Argon. Willson, Stephen P.; Andrews, Lester Chemistry Department, University of Virginia Charlottesville, VA 22901, USA J. Phys. Chem. A, 103(35), 6972-6983 (English) 1999 This paper is the 2nd segment of a study into the reaction products of laser-ablated lanthanide metal atoms with O2. There is general

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1999

F: LnO
P: 3

131:249649 Characterization of the Reaction Products of Laser-Ablated Lat Lanthanide Metal Atoms with Molecular Oxygen: Infrared Spectra of LnO, Ln LnO-, LnO2, LnO2-, LnO3-, and (LnO)2 in Solid Argon. Willson, Stephen P.; Andrews, Lester

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