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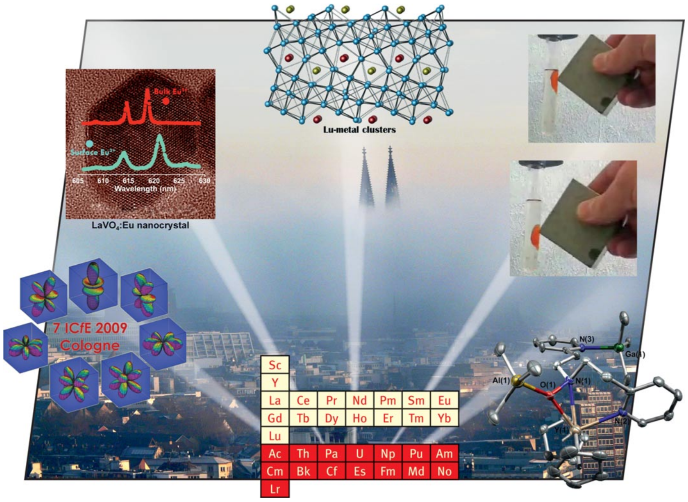
COVER PICTURE

The cover picture highlights a few of the fine collection of articles assembled in this Cluster Issue on f elements, based on presentations at the 7th International Conference on f Elements held in Cologne (23–27 August 2009). The individual graphics making up the composite design are set against a background depicting Cologne, with the Cathedral only just visible in the mist. Just as the sun clears the mist to reveal a beautiful view, our deepened understanding of f-element chemistry opens up new avenues in the chemistry landscape. The diversity of the f elements is reflected in the contributions shown on the cover. The solid-state chemistry of Lu–Bi–Te clusters is highlighted by J. D. Corbett et al. (p. 2620ff), and the importance of ionic liquids in f-element chemistry, as illustrated by the response of the lanthanide ionic liquid to an externally applied magnetic field, is reviewed by A.-V. Mudring et al. (p. 2569ff). The binding mode in rare-earth metal complexes with donor-functionalised hydroxylaminato ligands is featured by N. W. Mitzel et al. (p. 2774ff), and the luminescence behaviour of $LaVO_4$:Eu nanocrystals is revealed by C.-H. Yan et al. (p. 2626ff). A hearty thanks to the authors for their valuable contributions to the cover.



CONTENTS

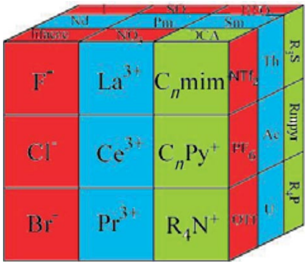
MICROREVIEWS

Ionic Liquids

A.-V. Mudring,*
S. Tang **2569–2581**

Ionic Liquids for Lanthanide and Actinide Chemistry

Keywords: Actinides / Homogeneous catalysis / Ionic liquids / Lanthanides / Luminescence



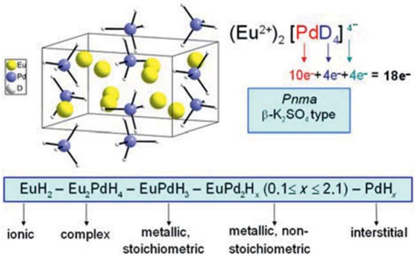
The widely tuneable class of ionic liquids has become important for lanthanide and actinide coordination chemistry, f-element spectroscopy, f-element electrochemistry and electrodeposition, organic synthesis and catalysis as well as inorganic nanomaterial synthesis.

Solid-State Hydrides

H. Kohlmann* **2582–2593**

Solid-State Structures and Properties of Europium and Samarium Hydrides

Keywords: Europium / Samarium / Hydrides / Neutron diffraction / X-ray diffraction



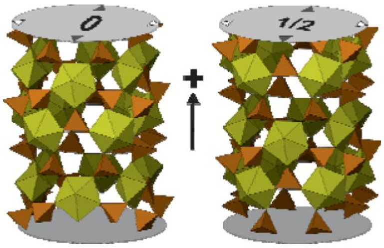
A survey on the available crystal structural data shows that europium and samarium hydrides exhibit rich crystal chemistry, ranging from ionic to complex and interstitial type compounds. While europium is always divalent, samarium is also found to be trivalent in its hydrides. Practical solutions are given to perform neutron diffraction with highly absorbing samples, such as ^{nat}Eu and ^{nat}Sm.

Modeling Actinide Compounds

S. V. Krivovichev* **2594–2603**

Actinyl Compounds with Hexavalent Elements (S, Cr, Se, Mo) – Structural Diversity, Nanoscale Chemistry, and Cellular Automata Modeling

Keywords: Actinides / Uranium / Crystal structure / Nanotubes / Cellular automata



Basic features of the structural chemistry of actinyl compounds with TO_4 tetrahedral oxyanions (T = S, Cr, Se, and Mo) are outlined with particular attention to structural topologies, nanoscale units, and algorithmic generation of structures by using cellular automata.

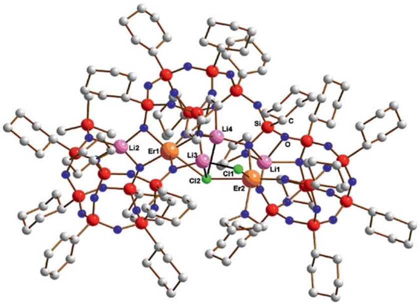
SHORT COMMUNICATIONS

Erbium Silsesquioxane Clusters

V. Lorenz, S. Blaurock, C. G. Hrib,
F. T. Edelmann* **2605–2608**

Coupling of Silsesquioxane Cages in the Coordination Sphere of Erbium

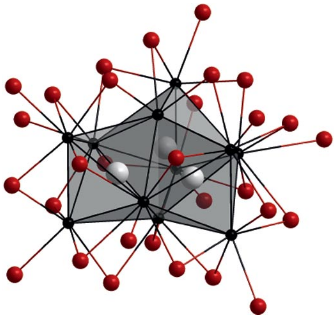
Keywords: Lanthanides / Silsesquioxanes / Metallasilsesquioxanes / Erbium / Cluster compounds



Reaction of in situ prepared $(c\text{-}C_6H_{11})_7\text{-}Si_7O_9(OLi)_3$ with $ErCl_3$ in thf solution afforded the large heterometallic (Er/Li) metallasilsesquioxane cluster $(c\text{-}C_6H_{11})_{21}\text{-}Si_{21}O_{36}\text{-}(SiMe_3)Er_2(thf)_2Li_4Cl_2$ in good yield (65%). An X-ray structure determination of it revealed several unusual features, including the coupling of wo silsesquioxane cages through an $-O_3Si(c\text{-}C_6H_{11})-$ unit as well as trimethylsilylation of an Si–OH functionality.

Cluster Halides

The trimeric cluster $\{Ir_3Gd_{11}\}$ with a structure analogous to that of the cesium suboxide $\{O_3Cs_{11}\}$ (face-sharing octahedra) was observed as embedded in the cluster complex $\{Ir_3Gd_{11}\}Br_{30}$. These are connected according to the formulation $\{Ir_3Gd_{11}\}Br^{i-i}_{12/2}Br^{i-a}_{9/2}Br^{a-i}_{9/2}$.



M. Brühmann, G. Meyer* **2609–2611**

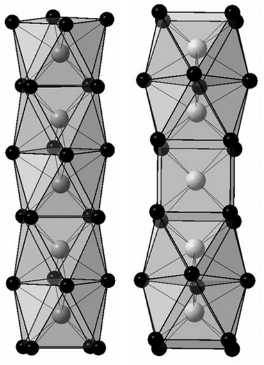
A Topological Link between Lanthanide and Alkali-Metal Clusters: Face-Sharing Gadolinium Octahedra Centered by Endohedral Iridium Atoms in $\{Ir_3Gd_{11}\}Br_{15}$

Keywords: Bromides / Cluster compounds / Gadolinium / Iridium / Rare earths

FULL PAPERS

Cluster Halides

Eight-coordinate endohedral atoms of sixth-period elements (Z = Re, Os, Ir) are present in the extended cluster complexes $\{ReGd_4\}Br_4$, $\{OsSc_4\}Cl_4$ $\{Ir_3Sc_{12}\}Br_{16}$, and $\{Os_3Sc_{12}\}Br_{16}Sc$ with different $\{ZR_{4/2}\}$ chains for the two formula types. Chemical bonding is dominated by endohedral atom–cluster atom (Z–R) and cluster atom–halide (R–X) interactions.

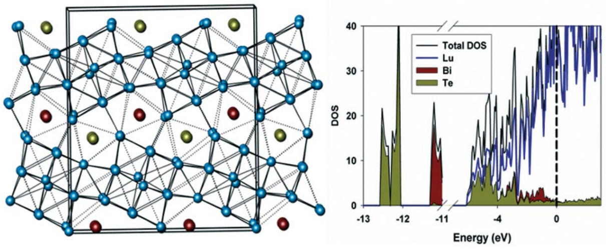


S. Zimmermann, M. Brühmann, F. Casper, O. Heyer, T. Lorenz, C. Felser, A.-V. Mudring,* G. Meyer* ... **2613–2619**

Eight-Coordinate Endohedral Rhenium, Osmium and Iridium Atoms in Rare-Earth Halide Cluster Complexes

Keywords: Cluster compounds / Crystal structures / Electronic structure / Endohedral atoms

Condensed Clusters



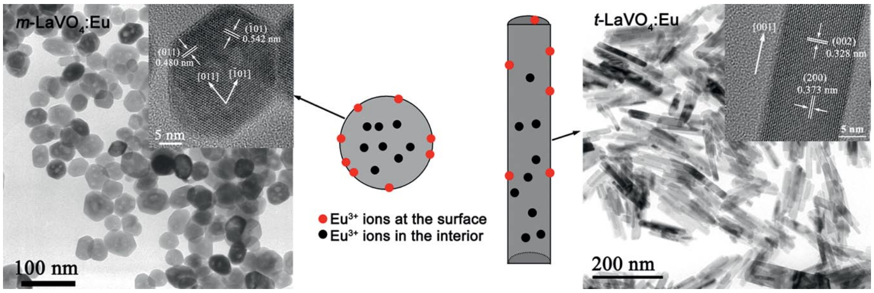
Incorporation of bismuth into a lutetium-rich telluride system produces the new ternary phase $Lu_9Bi_{\approx 1}Te_{\approx 1}$ with the orthorhombic Sc_9Te_2 structure. Partial oxidation of the Lu component is evident from the significant number of empty Lu 5d states above the Fermi level (dashed line).

S. Gupta, P. A. Maggard, J. D. Corbett* **2620–2625**

A Bismuth-Stabilized Metal-Rich Telluride $Lu_9Bi_{\approx 1.0}Te_{\approx 1.0}$ – Synthesis and Characterization

Keywords: Rare earths / Cluster compounds / Tellurium / Solid state chemistry / Hamilton populations

Doped Ln Vanadate Nanocrystals



Pure monoclinic (m) and tetragonal (t) $LaVO_4$:Eu nanocrystals were prepared by the facile hydrothermal method assisted with citric and EDTA anions, respectively. Relative to m-$LaVO_4$:Eu, t-$LaVO_4$:Eu nanocrystals are promising phosphors with high quantum yields and low cost.

C.-J. Jia, L.-D. Sun,* Z.-G. Yan, Y.-C. Pang, S.-Z. Lü, C.-H. Yan* **2626–2635**

Monazite and Zircon Type $LaVO_4$:Eu Nanocrystals – Synthesis, Luminescent Properties, and Spectroscopic Identification of the Eu^{3+} Sites

Keywords: Rare earths / Nanocrystals / Vanadates / Europium / Doping / Luminescence

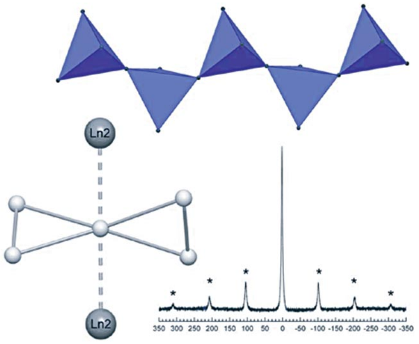
CONTENTS

Lithium Nitridosilicates

S. Lupart, M. Zeuner, S. Pagano,
W. Schnick* .... 2636−2641

Chain-Type Lithium Rare-Earth Nitridosilicates − $Li_5Ln_5Si_4N_{12}$ with Ln = La, Ce [dc0]?'

Keywords: Solid-state structures / Lithium / Nitridosilicates / Silicon



Two new quaternary lithium rare earth nitridosilicates $Li_5Ln_5Si_4N_{12}$ (Ln = La, Ce) with nonbranched SiN_4 *zweier* single-chains have been characterized. The method of using lithium melts in closed systems at moderate temperatures has been extended to the synthesis of rare earth element containing compounds. The ^7Li solid-state NMR spectrum of $Li_5La_5Si_4N_{12}$ is reported.

Non-Centrosymmetric Crystals

L. Bohatý, R. Fröhlich, P. Held,
P. Becker* .... 2642−2648

Non-Centrosymmetric Ammonium Rare Earth Nitrates $(NH_4)_2Ln(NO_3)_5{\cdot}4H_2O$ − Crystal Structure, Crystal Growth and Optical Properties

Keywords: Crystal growth / Refractive indices / SHG phase matching / Structure elucidation / Rare earths

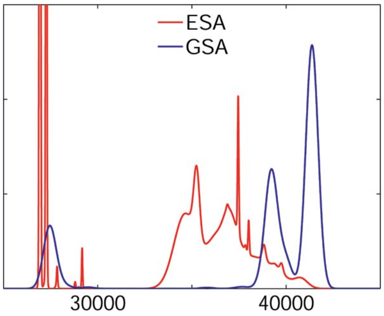
Crystals of $(NH_4)_2Ln(NO_3)_5{\cdot}4H_2O$ (Ln = La, Ce) are piezoelectric and pyroelectric and therefore non-centrosymmetric and polar. Crystals with Ln = La, Ce, Pr, Nd are isomorphic and belong to the space group *Cc*. Large single crystals of the La and the Ce compounds were grown. Their refractive indices and dispersion allow the realization of phase-matching conditions for second harmonic generation.

High-Energy Lanthanide States

M. F. Reid,* L. Hu, S. Frank, C.-K. Duan,
S. Xia, M. Yin........................ 2649−2654

Spectroscopy of High-Energy States of Lanthanide Ions

Keywords: Lanthanides / Rare earths / Crystal field / Ab initio calculations / UV/Vis spectroscopy / Laser spectroscopy



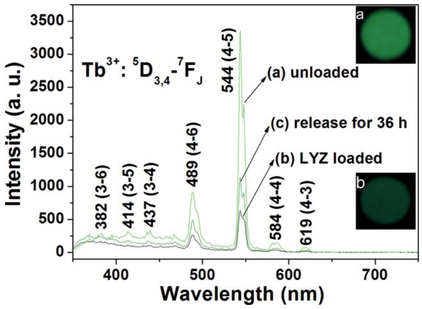
High-energy states of lanthanide ions in crystals may be analyzed by a combination of quantum-chemical calculations and phenomenological crystal-field models. We show that sharp lines may be obtained in excited-state absorption (ESA) spectra, and hence more information about the excited states could be obtained by using ESA than broad-band ground-state absorption (GSA) spectra.

Luminescent Composites

S. Huang, C. Li, P. Yang, C. Zhang,
Z. Cheng, Y. Fan, J. Lin* ...... 2655−2662

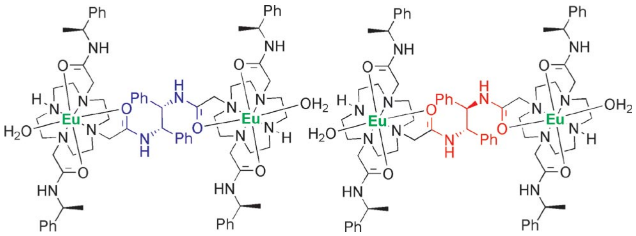
Luminescent $CaWO_4$:Tb^{3+}-Loaded Mesoporous Silica Composites for the Immobilization and Release of Lysozyme

Keywords: Immobilization / Luminescence / Mesoporous materials / Lanthanides / Bioinorganic chemistry



Luminescent $CaWO_4$:Tb^{3+}-loaded mesoporous silica composites with various morphologies were synthesized to serve as supports for lysozyme immobilization and release. These composites show specific lysozyme adsorption capacities at different solution pH values. The release of the enzyme can be tracked by the change in the photoluminescence of Tb^{3+} in $CaWO_4$:Tb^{3+}@rod-like SBA-15.

Dinuclear Lanthanide Complexes



Complexes of Ln^{III} (Ln = Eu, Tb, Yb) with diasteromeric ditopic ligands reveal differing anion binding profiles; circularly polarised luminescence studies of Eu systems show significant differences in the local helicity at the metal centre.

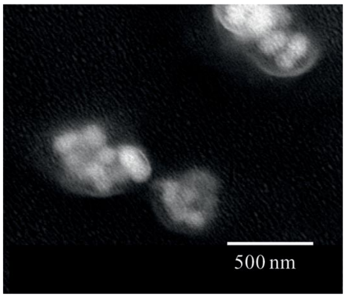
**B. S. Murray, D. Parker,*
C. M. G. dos Santos,
R. D. Peacock 2663–2672**

Synthesis, Chirality and Complexation Phenomena of Two Diastereoisomeric Dinuclear Lanthanide(III) Complexes

Keywords: Lanthanides / Europium / Luminescence / Chirality

NIR Bioimaging

Liposome-encapsulated, Er-doped Y_2O_3 nanoparticles were developed as near-infrared (NIR) bioimaging probes. The characteristics of the liposomes with surface modification and their distribution after injection into the body of a mouse are reported with microscopic and macroscopic NIR fluorescence images.



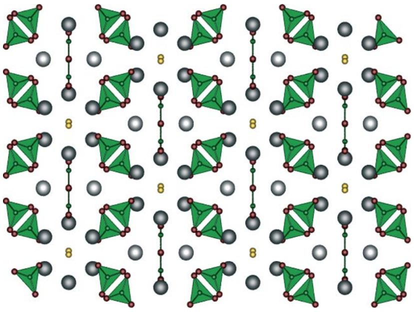
**K. Soga, K. Tokuzen, K. Tsuji, T. Yamano,
H. Hyodo, H. Kishimoto 2673–2677**

NIR Bioimaging: Development of Liposome-Encapsulated, Rare-Earth-Doped Y_2O_3 Nanoparticles as Fluorescent Probes

Keywords: Bioimaging / Rare earths / Liposomes / Ceramics / Fluorescent probes / Nanoparticles

Europium(II) Borate Fluoride

$Eu_5(BO_3)_3F$, structurally similar to fluoroapatite, is the first europium(II) borate fluoride and exhibits an ordered distribution of the O and F atoms.



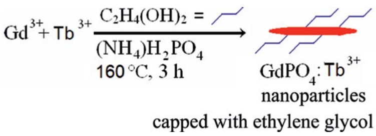
**K. Kazmierczak,
H. A. Höppe* 2678–2681**

Synthesis, Crystal Structure and Optical Spectra of Europium Borate Fluoride $Eu_5(BO_3)_3F$

Keywords: Structure elucidation / Europium / Borates / Fluorides / Optical spectroscopy

Phosphor Nanoparticles

Nanoparticles of Tb^{3+}-doped $GdPO_4$ have been prepared at a low temperature and show green luminescence. There is a strong energy transfer from Gd^{3+} to Tb^{3+}. These nanoparticles are dispersible in polar solvents and can be incorporated in polyvinyl alcohol polymer to make a film.



**N. Yaiphaba, R. S. Ningthoujam,*
N. R. Singh,* R. K. Vatsa 2682–2687**

Luminescence Properties of Redispersible Tb^{3+}-Doped $GdPO_4$ Nanoparticles Prepared by an Ethylene Glycol Route

Keywords: Lanthanides / Luminescence / Nanoparticles / Dispersion / Polymers

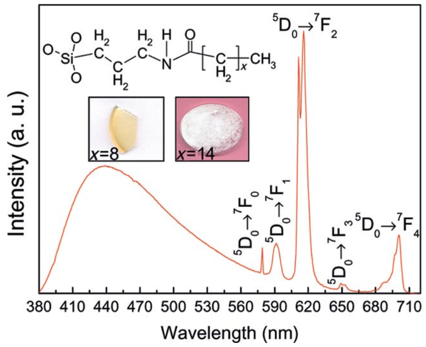
CONTENTS

Eu-Doped Alkyl/Siloxane Hybrids

S. C. Nunes, J. Planelles-Aragó,
R. A. S. Ferreira, L. D. Carlos,*
V. de Zea Bermudez* 2688–2699

Eu^{III}-Doping of Lamellar Bilayer and Amorphous Mono-Amide Cross-Linked Alkyl/Siloxane Hybrids

Keywords: Organic–inorganic hybrid composites / Sol–gel processes / Luminescence / Europium



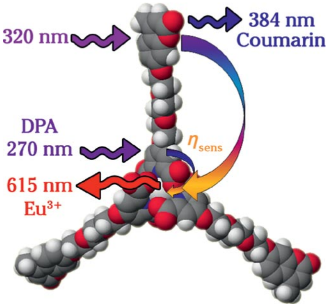
Two structurally different but chemically similar series of mono-amidosil alkyl/siloxane hosts have been doped with a wide range of concentrations of $Eu(CF_3SO_3)_3$. The influence of the structure of the two mono-amidosils (lamellar bilayer or amorphous matrix) on the photoluminescence features is addressed by using Eu^{3+} ions as a local probe.

Double Europium(III) Sensitization

J. Andres, A.-S. Chauvin* 2700–2713

Europium Complexes of Tris(dipicolinato) Derivatives Coupled to Methylumbelliferone: A Double Sensitization

Keywords: N, O ligands / Lanthanides / Luminescence / Europium / Sensitization



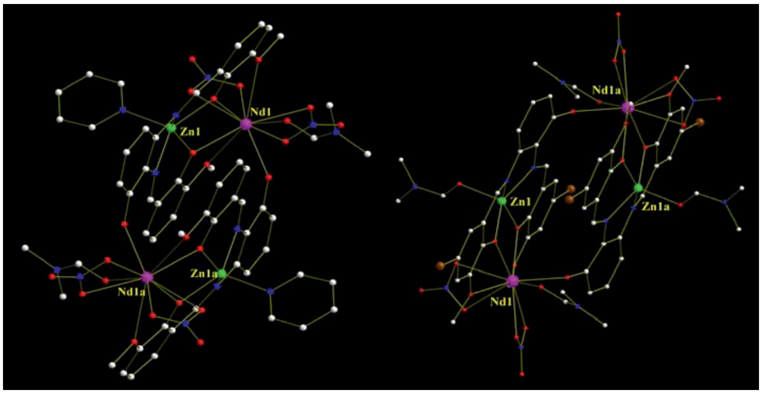
A dipicolinic acid ligand coupled to a polyoxyethylene chain with a coumarin chromophore at its extremity was used to complex Eu^{3+}, which affords a stable 1:3 Eu/L complex. The sensitization of the Eu^{3+} can occur by an excitation of the dipicolinato part (λ_{ex} = 270 nm) or through the coumarin moiety (λ_{ex} = 320 nm).

Heterometallic Schiff Base Complexes

X.-Q. Lü,* W.-X. Feng, Y.-N. Hui,
T. Wei, J.-R. Song, S.-S. Zhao,
W.-Y. Wong, W.-K. Wong,*
R. A. Jones* 2714–2722

Near-Infrared Luminescent, Neutral, -Cyclic Zn_2Ln_2 (Ln = Nd, Yb, and Er) Complexes from Asymmetric Salen-Type Schiff Base Ligands

Keywords: Zinc / Schiff bases / Lanthanides / Luminescence / Energy transfer



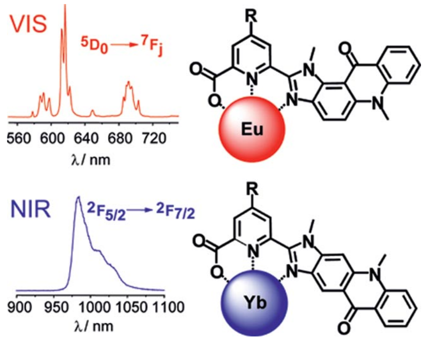
Upon excitation at 200–550 nm corresponding to the intraligand π→π* transitions of the Schiff base, complexes $[Zn_2(L^1)_2(py)_2Ln_2(NO_3)_4(dmf)_2]\cdot 3Et_2O$ and $[Zn_2(L^2)_2Ln_2(NO_3)_4(dmf)_4]$ (Ln = Nd, Yb, Er, Gd) emit strong NIR luminescence of the Ln^{3+} ions with lifetimes in ms ranges, whereas the ligand-centered singlet (^{1}LC) visible luminescence is mostly quenched by energy transfer from the ^{1}LC excited state to Ln^{3+} ions.

Lanthanide Luminescence

E. Deiters, F. Gumy,
J.-C. G. Bünzli* 2723–2734

Acridone-Benzimidazole Ring-Fused Ligands: A New Class of Sensitizers of Lanthanide Luminescence via Low-Energy Excitation

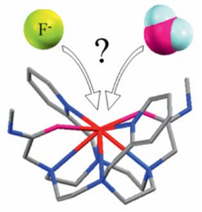
Keywords: Tridentate ligands / Luminescence / Energy transfer / Lanthanides / Sensitizers / Radiative lifetime / Sensitization efficiency



Two new tridentate ring-fused acridone-benzimidazole ligands have been prepared. They sensitize europium and ytterbium luminescence upon excitation with visible light (410–430 nm).

Fluoride Sensing

Positively charged Ln^{III} complexes bind F^- anions with a high selectivity over Cl^- and Br^-. Fluoride binding replaces an inner-sphere water molecule, which results in important changes in the shape and intensity of the emission spectrum of the Eu^{III} complex. Thus, these systems show promise in the field of fluoride sensing.



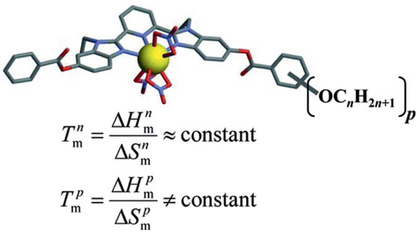
R. Tripier,* C. Platas-Iglesias, A. Boos, J.-F. Morfin, L. Charbonnière* **2735–2745**

Towards Fluoride Sensing with Positively Charged Lanthanide Complexes

Keywords: Lanthanides / Macrocyclic ligands / Luminescence / Anions / Sensors

Lanthanidomesogens

Enthalpy/entropy compensation occurs for the simple increase (n) of the length of the peripheral flexible alkyl chains in lanthanide-containing thermotropic liquid crystals. The connection of an increasing number of divergent chains in polycatenar ligands (p) circumvents this limitation and allows some deliberate tuning of the melting temperatures in lanthanidomesogens.



$$T_m^n = \frac{\Delta H_m^n}{\Delta S_m^n} \approx \text{constant}$$

$$T_m^p = \frac{\Delta H_m^p}{\Delta S_m^p} \neq \text{constant}$$

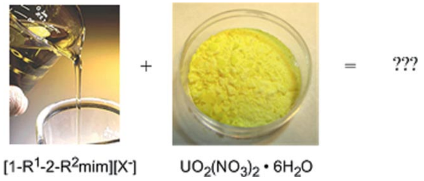
A. Escande, L. Guénée, E. Terazzi, T. B. Jensen, H. Nozary, C. Piguet* **2746–2759**

Enthalpy/Entropy Compensation in the Melting of Thermotropic Nitrogen-Containing Chelating Ligands and Their Lanthanide Complexes: Successes and Failures

Keywords: Thermodynamics / Lanthanides / Liquid crystals / Thermotropic behavior / Polycatenar compounds

Uranyl Salts from Ionic Liquids

Initial studies in the crystallization of uranyl species from ionic liquids or by reaction with ionic liquid precursors led to the isolation of three new imidazolium-based salts of bis-μ-hydroxo-bis[bis(nitrato-*O*,*O*)dioxouranate(VI)] and one of trichlorobis(nitrato-*O*,*O*)dioxouranate(VI).



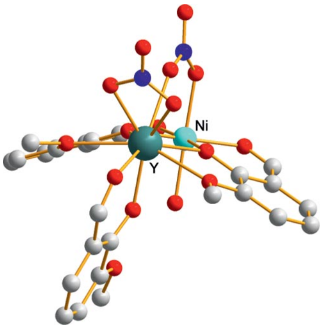
V. Cocalia, M. Smiglak, S. P. Kelley, J. L. Shamshina, G. Gurau, R. D. Rogers* **2760–2767**

Crystallization of Uranyl Salts from Dialkylimidazolium Ionic Liquids or Their Precursors

Keywords: Actinides / Uranium / Uranyl salts / Ionic liquids

Magnetic Ni–Ln Complexes

ortho-Vanillin can yield two types of heterodinuclear $Ni^{II}–Ln^{III}$ complexes that differ by their formulation and structure, depending on the solvent used. A D_{Ni} zero field splitting (zfs) term is active in these complexes. The departure from planarity of the equatorial *ortho*-vanillin ligands is responsible for the slight decrease in the ferromagnetic Ni–Gd interaction.



J.-P. Costes,* L. Vendier **2768–2773**

Structural and Magnetic Studies of New $Ni^{II}–Ln^{III}$ Complexes

Keywords: Coordination Chemistry / Nickel / Lanthanides / Structure elucidation / Magnetic properties

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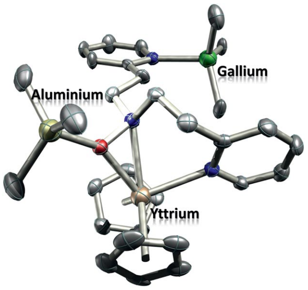
RE Metal Complex Adducts

B. J. Hellmann, A. Mix,
B. Neumann, H.-G. Stammler,
N. W. Mitzel* 2774–2786

AlMe$_3$, GaMe$_3$ and InMe$_3$ Adducts of *N*,*N*-Bis(2-{pyrid-2-yl{ethyl)hydroxylaminato Rare-Earth Metal Complexes and Their Molecular Dynamics

Keywords: Rare earths / Hydroxylamines / Hemilability / N,O-Ligands / Molecular dynamics



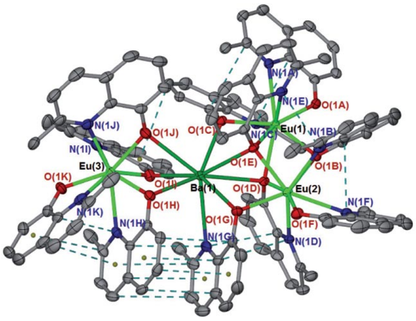
Three in one: The *N*,*N*-bis(2-{pyrid-2-yl}ethyl)hydroxylaminato ligand allows generating heterobi- and -trimetallic complexes by adduct formation of [Cp$_2$Ln{η^2-ON(C$_2$H$_4$-*o*-Py)$_2$}] with AlMe$_3$, GaMe$_3$ and InMe$_3$. All complexes exhibit a highly dynamic behaviour in solution.

Pseudo-Solid-State Syntheses

G. B. Deacon, C. M. Forsyth, P. C. Junk,*
A. Urbatsch 2787–2797

Syntheses at Elevated Temperature and Structures of Lanthanoid/Alkaline Earth Heterobimetallic Derivatives of 2-Methyl-8-hydroxyquinoline

Keywords: Lanthanides / Alkaline earth metals / Structure elucidation / N, O ligands



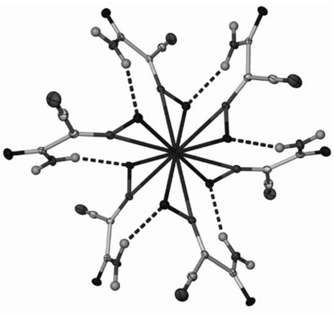
Rearrangement reactions of Ln(MQ)$_3$ and AE(MQ)$_2$ compounds (HMQ = 2-methyl-8-hydroxyquinoline) at elevated temperatures in a 1,2,4,5-tetramethylbenzene (TMB) flux provide a useful route to homoleptic [Ln$_2$AE(MQ)$_8$] complexes, and the new [Eu$_3$Ba(MQ)$_{11}$]·2TMB and [Ln$_3$(MQ)$_7$CO$_3$] (Ln = Eu, Er) complexes have also been obtained by this route.

Rare-Earth Nitroso Complexes

A. S. R. Chesman, D. R. Turner,
G. B. Deacon, S. R. Batten* 2798–2812

New Approaches to 12-Coordination: Structural Consequences of Steric Stress, Lanthanoid Contraction and Hydrogen Bonding

Keywords: Lanthanides / Lanthanide contraction / Nitroso ligand / Hydrogen bonds / Steric hindrance



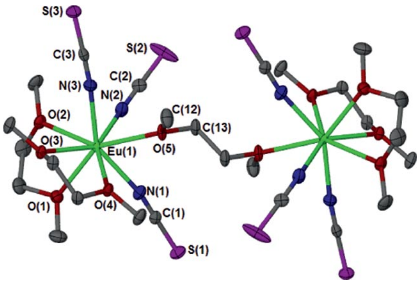
Rare-earth complexes containing nitroso bonding ligands dicyanonitrosomethanide, C(CN)$_2$(NO)$^-$, and carbamoylcyanonitrosomethanide, C(CONH$_2$)(CN)(NO)$^-$, demonstrate a variety of coordination modes from symmetrical η^2(N,O) to monodentate η^1(O). The effects upon the coordination environment of the lanthanoid contraction. Intramolecular hydrogen bonding and steric influences of co-ligands are discussed.

Synthesis by Redox Transmetallation

J. M. Bakker, G. B. Deacon,*
C. M. Forsyth, P. C. Junk,*
M. Wiecko 2813–2825

A Structural Investigation of Trivalent and Divalent Rare Earth Thiocyanate Complexes Synthesised by Redox Transmetallation

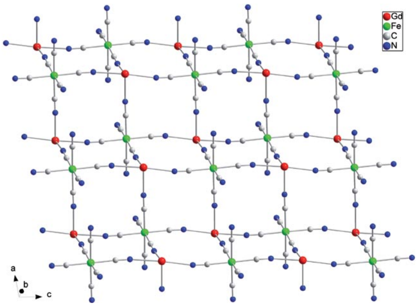
Keywords: Rare earths / N ligands / Ether ligands / Redox chemistry / Transmetallation / Solid-state structures



Solvated rare earth thiocyanate complexes synthesised by redox transmetallation between RE metals and Hg(SCN)$_2$ yield compounds with a wide variety of structural types featuring RE–NCS and/or RE–NCS–RE bonding.

Bimetallic 4f–3d Arrays

Fourteen cyano-bridged 2D bimetallic 4f–3d arrays with monolayered stair-like, brick-wall-like, or bilayered topologies were rationally prepared by the ball-milling method, and their structures were also characterized. The relationship between the crystal structures and the controllable syntheses was discussed.



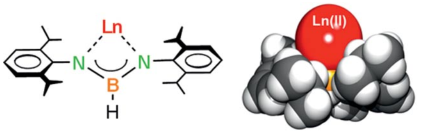
W.-T. Chen, A.-Q. Wu, G.-C. Guo,*
M.-S. Wang, L.-Z. Cai,
J.-S. Huang **2826–2835**

Cyano-Bridged 2D Bimetallic 4f–3d Arrays with Monolayered Stair-Like, Brick-Wall-Like, or Bilayered Topologies – Rational Syntheses and Crystal Structures

Keywords: Lanthanides / N ligands / Synthesis design / Self-assembly / Prussian blue complexes

Bora-Amidinate Complexes

The first bora-amidinate (*bam*) complexes of the lanthanide metals in the +2 oxidation state could be successfully obtained by reaction of DIPP(H)N–BH-N(H)DIPP with a benzylic lanthanide(II) precursor. The crystal structures show very small N–Ln–N′ bite angles (ca. 60°) that leave a large part of the metal coordination sphere available for neutral thf ligands.



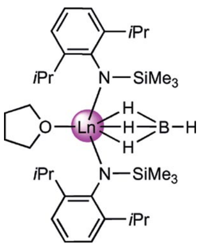
S. Harder,* D. Naglav **2836–2840**

Bora-Amidinate Complexes of Lanthanide(II) Metals

Keywords: Lanthanides / Europium / Ytterbium / Samarium

Controlling ate-Complex Formation

Deliberate choice of the reaction conditions gives access to monomeric alkali metal-free heteroleptic complexes Y[N-(SiMe$_3$)(C$_6$H$_3$*i*Pr$_2$-2,6)]Cl$_2$(thf)$_3$ and Ln[N-(SiMe$_3$)(C$_6$H$_3$*i*Pr$_2$-2,6)]$_2$(BH$_4$)(thf) (Ln = Nd, La; depicted) according to salt metathesis protocols, with solvent effects and type of alkali metal amide precursor deserving closer attention.

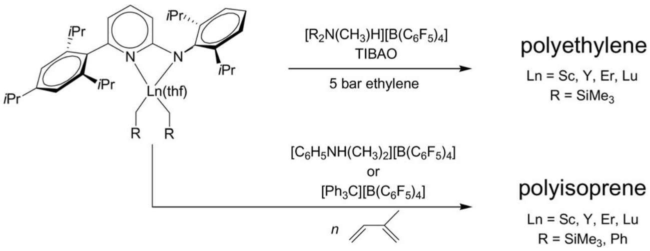


C. Schädle, C. Meermann, K. W. Törnroos,
R. Anwander* **2841–2852**

Rare-Earth Metal Phenyl(trimethylsilyl)-amide Complexes

Keywords: Rare earths / N ligands / Polymerization

Ln Polymerization Catalysts



Aminopyridinato ligand-stabilized alkyllanthanoid complexes were synthesized and structurally characterized. These complexes are, after activation, active catalysts for the polymerization of ethylene and isoprene. The obtained polyisoprenes have an increased 3,4-content, which decreases with increasing metal ion radius. An ethylene polymerisation activity maximum is observed for Er.

C. Döring, W. P. Kretschmer,
R. Kempe* **2853–2860**

minopyridinate-Stabilized Lanthanoid Complexes: Synthesis, Structure and Polymerization of Ethylene and Isoprene

Keywords: Polymerization / Ethylene / Isoprene / Lanthanoids / Aminopyridinato ligands

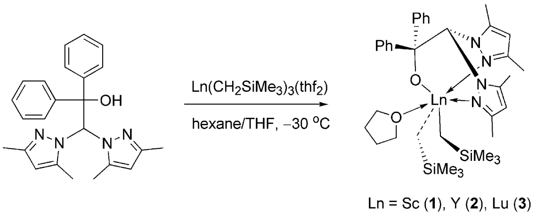
CONTENTS

Rare-Earth Metal Alkyl Complexes

Z. Zhang, D. Cui,*
A. A. Trifonov 2861–2866

Synthesis and Characterization of Heteroscorpionate Rare-Earth Metal Dialkyl Complexes and Catalysis on MMA Polymerization

Keywords: Rare earths / Tridentate ligands / Polymerization



Ln = Sc (**1**), Y (**2**), Lu (**3**)

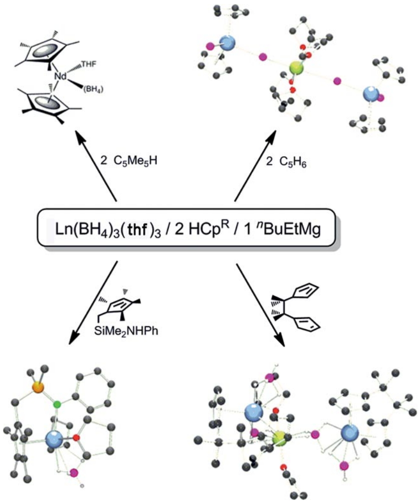
The first heteroscorpionate ligated rare-earth metal dialkyl complexes were prepared via alkane elimination. These complexes were effective catalysts for the polymerization of methyl methacrylate to produce syndiotactically enriched poly(methyl methacrylate) with narrow molecular weight distribution.

Organolanthanide Catalysts

M. Visseaux,* M. Terrier, A. Mortreux,
P. Roussel 2867–2876

Facile Synthesis of Lanthanidocenes by the "Borohydride/Alkyl Route" and Their Applica-tion in Isoprene Polymerization

Keywords: Lanthanides / Metallocenes / Structure elucidation / Polymerization / Homogeneous catalysis



Borohydridolanthanidocenes were easily prepared by a straightforward synthetic approach, starting from their tris(borohydride)s, a ligand in its protonated form, and the stoichiometric amount of dialkylmagnesium reagent. These compounds were found to be very efficient in isoprene polymerization. Our approach also enables the rapid screening of a given ligand for polymerization catalysis.

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💻 Supporting information on the WWW (see article for access details).

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