

Chem Soc Rev

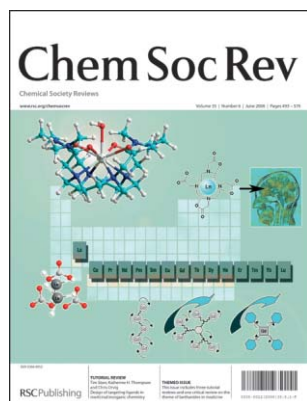
Chemical Society Reviews

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IN THIS ISSUE

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Cover

See Katherine H. Thompson and Chris Orvig, page 499. The medical applications of lanthanides are diverse: MRI contrast agents, hypophosphatemic agents for kidney dialysis patients, luminescent probes in cell studies, and for palliation of bone pain in osteosarcoma. Image reproduced by permission of Katherine H. Thompson and Chris Orvig, *Chem. Soc. Rev.*, 2006, 35, 499.

CHEMICAL SCIENCE

C41

Drawing together the research highlights and news from all RSC publications, *Chemical Science* provides a 'snapshot' of the latest developments across the chemical sciences showcasing newsworthy articles, as well as the most significant scientific advances.

Chemical Science

June 2006/Volume 3/Issue 6

www.rsc.org/chemicalscience

EDITORIAL

499

Editorial: Lanthanide compounds for therapeutic and diagnostic applications

Katherine H. Thompson and Chris Orvig

Katherine Thompson and Chris Orvig introduce an issue of *Chemical Society Reviews* on the theme 'Lanthanides in Medicine'.



Katherine Thompson



Chris Orvig

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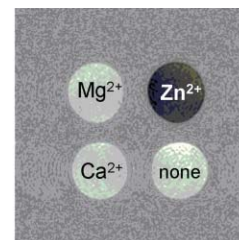
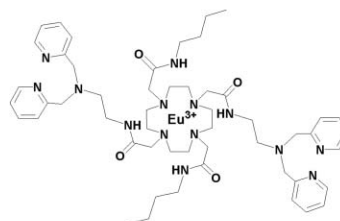
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500

Paramagnetic lanthanide complexes as PARACEST agents for medical imaging

Mark Woods, Donald E. Woessner and A. Dean Sherry*

A new class of lanthanide complexes that can alter MR image contrast by a chemical exchange saturation transfer (CEST) mechanism offers new opportunities to image metabolism in tissues.

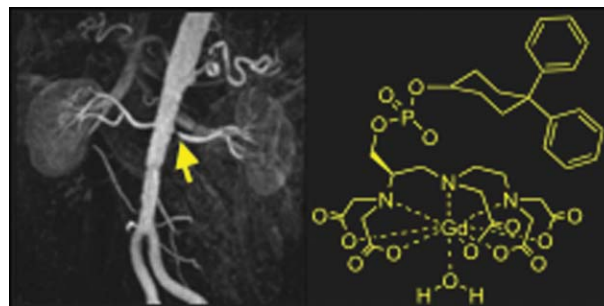


512

Strategies for increasing the sensitivity of gadolinium based MRI contrast agents

Peter Caravan

Bright is beautiful: MS-325 (shown) targets blood proteins to identify diseased vessels. Improved sensitivity is needed for lower concentration targets.

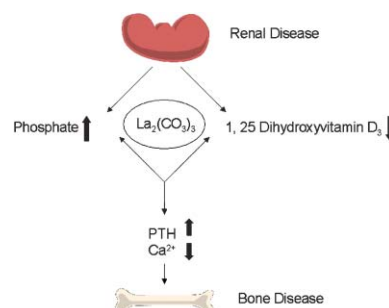


524

The therapeutic application of lanthanides

Simon P. Fricker

After over a century searching for a therapeutic use for lanthanides, Fosrenol ($\text{La}_2(\text{CO}_3)_3$) is approved for the treatment of hyperphosphatemia.

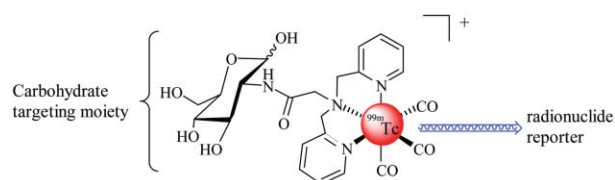


534

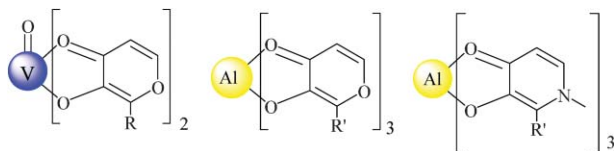
Design of targeting ligands in medicinal inorganic chemistry

Tim Storr,* Katherine H. Thompson and Chris Orvig*

This *tutorial review* will highlight recent advances in medicinal inorganic chemistry pertaining to the use of multifunctional ligands that target specific tissues, membrane receptors, or endogenous molecules, including enzymes.



545

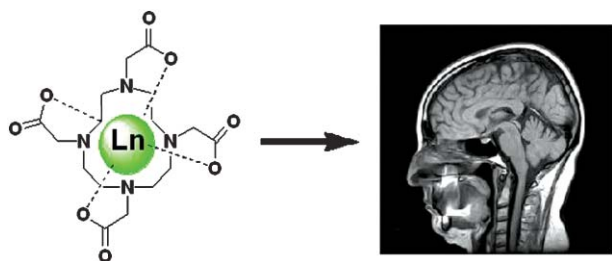


Metal complexes of maltol and close analogues in medicinal inorganic chemistry

Katherine H. Thompson,* Cheri A. Barta and Chris Orvig

A critical review of hydroxypyronone and hydroxypyridinone ligands used in medicinal inorganic chemistry applications, ranging from metal ion depletion to pharmaceutical uses of metal ion-ligand complexes. Shown are simple examples of such complexes: bis(3,4-hydroxypyronato)oxovanadium(IV) complexes assessed for insulin mimetic potential (left); tris(3,4-hydroxypyrono)Al(III) (middle), and tris(3,4-hydroxypyridinone)Al(III) (right), for neurotoxicity studies.

557



Lanthanides in magnetic resonance imaging

Melanie Bottrill, Lilian Kwok and Nicholas J. Long

The unique magnetic and luminescent properties of lanthanide complexes are leading the way in the design of new MRI (magnetic resonance imaging) contrast agents.

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