

# Prof Polly L Arnold Professor of Synthetic Inorganic Chemistry

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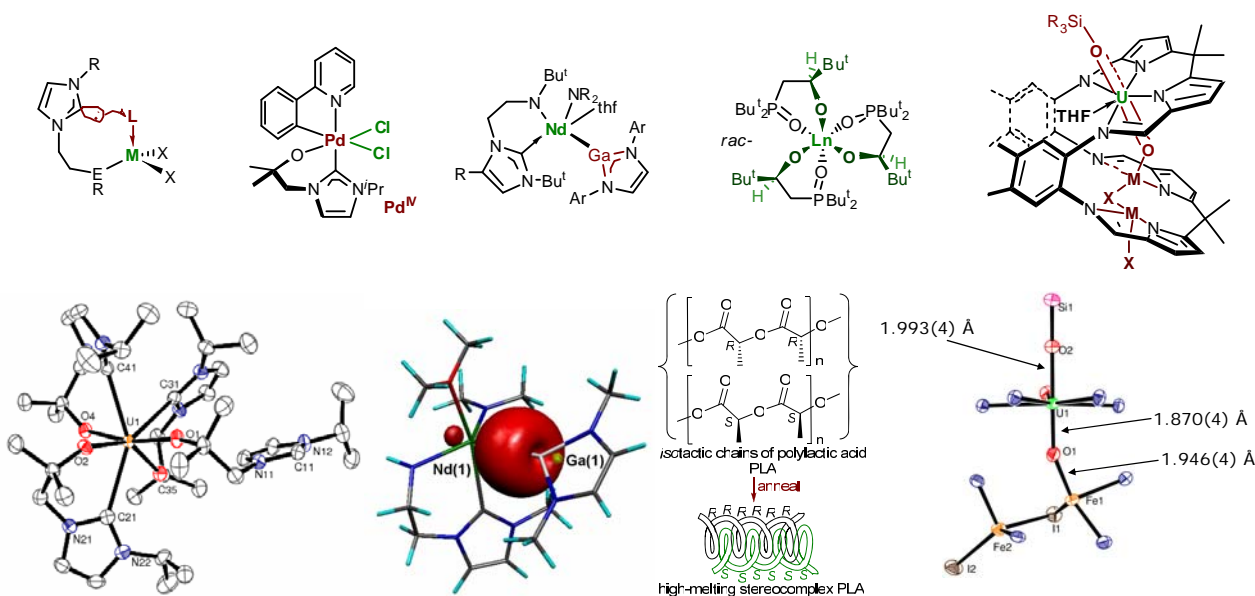
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Research interests: d- and f-block organometallic chemistry; small molecule activation chemistry; homogeneous catalysis



We are interested in making complexes that challenge our preconceived ideas about structure and bonding in early transition metal, and lanthanide and actinide chemistry. This involves the design of ligands to support complexes in unusual formal oxidation states or structural types, and the synthesis of new compounds that have the potential to engage in bonding or redox reactivities that would not be possible in more traditional systems.

We routinely test the reactivity of new complexes towards the activation of important small molecules including carbon monoxide and carbon dioxide, dinitrogen, oxygen, hydrogen, and alkenes and alkanes. Many of the complexes we study also display reactivity as catalysts for organic transformations, such as carbon-carbon bond forming reactions, and the polymerisation of polar monomers such as *rac*-lactide, to make biodegradable polymers.



We are also involved in both local and international collaborations with other synthetic chemists in the study of some of the reaction chemistry, and with computational chemists to help understand the bonding in the more unusual systems.

## SELECTED RECENT PUBLICATIONS

1. Review: F-block N-heterocyclic carbene complexes [P. L. Arnold, I. J. Casely \*Chem. Rev.\* \*\*2009\*\*, \*109\*, 3599.](#)
2. Reduction and selective oxo-group silylation of the uranyl dication [P. L. Arnold, D. Patel, C. Wilson, J. B. Love, \*Nature\* \*\*2008\*\*, \*451\*, 315.](#) Nature News article [link](#). BBC [link](#). Telegraph [link](#). New Scientist [link](#).
3.  $C_3$ -symmetric complexes and their stereospecific polymerisation of lactide into biodegradable polymers [P. L. Arnold, J.-C. Buffet, R. Blaudeck, S. Sujecki, A. J. Blake, C. Wilson \*Angew. Chem. Int. Ed.\* \*\*2008\*\*, \*47\*, 6033.](#)
4. A complex containing the first lanthanide-gallium bond [P. L. Arnold, S. T. Liddle, J. McMaster, C. Jones, D. P. Mills, \*J. Am. Chem. Soc.\* \*\*2007\*\*, \*129\*, 5360.](#)
5. Chelating N-Heterocyclic carbene alkoxide as a supporting ligand for Pd-II/IV C-H bond functionalization catalysis [P. L. Arnold, M. S. Sanford and S. M. Pearson, \*J. Am. Chem. Soc.\*, \*\*2009\*\*, \*131\*, 13912.](#)