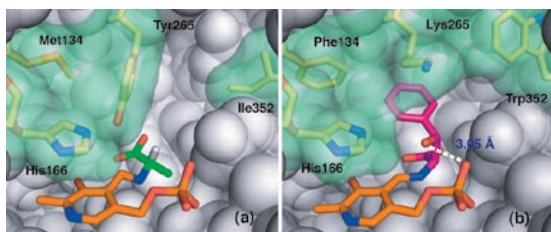


# Science Concentrates

## Enhancing Activity and Controlling Stereoselectivity in a Designed PLP-Dependent Aldolase

M. D. Toscano, M. M. Müller, and D. Hilvert\*, *Angew. Chem. Int. Ed.* **2007**, *46*, 4468  
Organic Chemistry Department, ETH Zürich

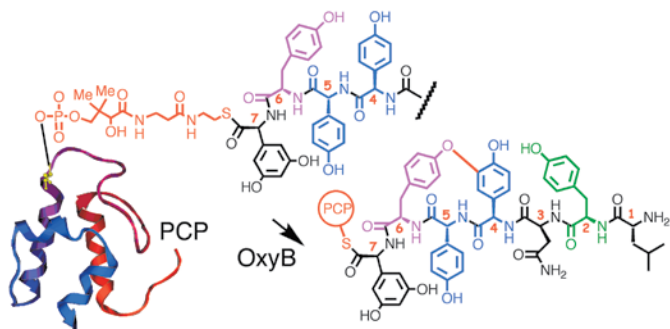
A single active site mutation in a pyridoxal phosphate (PLP)-dependent alanine racemase confers this enzyme with aldolase activity, while obliterating the original function. By mutating additional residues lining the substrate binding pocket, the engineered activity is further enhanced, and the stereoselectivity of the reaction can be controlled. These results demonstrate that engineered enzymes can be significantly improved by rational design towards attaining efficiencies and selectivities comparable to naturally evolved enzymes.



## Oxidative Phenol Coupling Reactions Catalysed by OxyB: A Cytochrome P450 from the Vancomycin Producing Organism. Implications for Vancomycin Biosynthesis

K. Woithe, N. Geib, K. Zerbe, D. B. Li, M. Heck, S. Fournier-Rousset, O. Meyer, F. Vitali, N. Matoba, K. Abou-Hadeed, and J. A. Robinson\*, *J. Am. Chem. Soc.* **2007**, *129*, 6887  
Department of Chemistry, University of Zurich

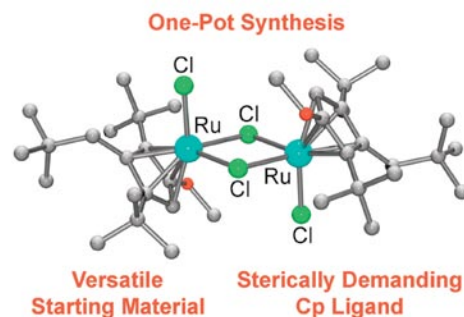
In this article the authors have studied OxyB, which is a cytochrome P450 enzyme that catalyzes the first phenol coupling reaction during the biosynthesis of vancomycin-like glycopeptide antibiotics. Using model peptides, it was shown that cross-linking of Hpg4 and Tyr6 by OxyB can occur in both hexapeptide- and heptapeptide-PCP conjugates. For turnover, OxyB requires electrons, which *in vitro* can be supplied by spinach ferredoxin and *E. coli* flavodoxin reductase. Turnover is also dependent upon the presence of molecular oxygen.



## A New Coupling Reaction for the Synthesis of Ruthenium Half-Sandwich Complexes with Sterically Demanding Cyclopentadienyl Ligands

S. Gauthier, E. Solari, B. Dutta, R. Scopelliti, and K. Severin\*, *Chem. Commun.* **2007**, 1837  
Institut des Sciences et Ingénierie Chimiques, EPFL

Ruthenium half-sandwich complexes with cyclopentadienyl ligands constitute a very important class of catalysts. In this context, the reaction of  $\text{RuCl}_3(\text{solvent})_n$  with *tert*-butylacetylene in methanol or ethanol that leads to the formation of chloro-bridged half-sandwich derivatives with sterically demanding cyclopentadienyl ligands is of importance; the resulting  $\text{Ru}^{\text{III}}$  complexes being of high interest as starting materials for the synthesis of novel Ru catalysts.



## Chemical Characterization of Element 112

R. Eichler\*, N. V. Aksenov, A. V. Belozero, G. A. Bozhikov, V. I. Chepigin, S. N. Dmitriev, R. Dressler, H. W. Gäggeler, V. A. Gorshkov, F. Haenssler, M. G. Itkis, A. Laube, V. Ya. Lebedev, O. N. Malyshev, Yu Ts. Oganessian, O. V. Petrushkin, D. Piguet, P. Rasmussen, S. V. Shishkin, A. V. Shutov, A. I. Svirikhin, E. E. Tereshatov, G. K. Vostokin, M. Wegrzecki, and A. V. Yerein, *Nature (London, U.K.)* **2007**, *447*, 72  
Paul Scherrer Institute, Villigen; University of Bern; Flerov Laboratory of Nuclear Reactions, Dubna, Russia; Institute of Electron Technology, Warsaw, Poland

The chemical characterization of the heaviest elements is not a trivial matter due to relativistic effects on the electronic structure which can strongly influence chemical properties. In this article, the authors report a reliable method for chemical characterization of element 112, based on the production of two atoms of  $^{283}112$  through the alpha decay of the short-lived  $^{287}114$  (which forms in the nuclear fusion reaction of  $^{48}\text{Ca}$  and  $^{242}\text{Pu}$ ) and the adsorption of the two atoms on a gold surface. These adsorption characteristics then establish element 112 as a typical element of group 12.



Zero can also be obtained on a switched-off apparatus