

# News Release



## **BASF with new class of enzymes for production of chiral intermediates**

- **Ongoing success in biocatalysis**
- **Growing portfolio of ChiPros**

BASF has developed a new class of enzymes that can be utilized for the industrial production of chiral intermediates: these specifically modified biocatalysts, which the company has patented, are called enoate reductases. The asymmetric bioreactions catalyzed by enoate reductases take place at low temperatures and standard pressure and, by being highly selective, yield particularly high-quality products. This allows a very efficient process for producing chemically sophisticated chiral molecules of outstanding optical purity. Examples include esters and aldehydes, which serve as starting materials in the production of active pharmaceutical and agrochemical ingredients.

Enoate reductases complement BASF's portfolio of enzymes, to date comprised of dehydrogenases, nitrilases and lipases. They are obtained from various organisms, for example yeasts like beer yeast, and from plants like tomato and tobacco.

## **Growing portfolio of chiral intermediates**

BASF provides its customers with access to a broad and steadily growing portfolio of chiral amines, beta-aminoacids, aminoalcohols, aromatic and aliphatic alpha-hydroxy acids, alcohols and epoxides.

June 12, 2008  
P 309/08e  
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Building on many years of experience in this field, the company can develop and produce new chiral intermediates in close cooperation with its customers anywhere in the world, purposefully and fast. Delivery quantities available range from the lab scale to large-scale industrial volumes. BASF currently operates three production facilities for ChiPros<sup>®</sup>, the brand name by which the company's chiral intermediates are traded, at its sites in Ludwigshafen, Germany, and Geismar, USA, with a combined annual capacity in excess of 4,000 metric tons.

Chiral molecules are vital in today's production of pharmaceuticals and crop protectants. The term "chiral" derives from the ancient Greek word "cheir" and means "hand." Like your left and right hands, chiral molecules are not superimposable: they are rather like mirror images of each other. This is a small difference that has a great impact on the effectiveness of pharmaceuticals and agrochemicals. Only one of the two types of molecule – experts refer to them as "enantiomers" – will produce the desired effect in the finished product.

Chiral intermediates are examples of the successful use of white biotechnology, which BASF considers to be a 21st century key technology. Also known as industrial biotechnology, white biotechnology allows many product and process innovations that would often be impossible to achieve by any other route. This technology employs microorganisms (fermentation) or isolated enzymes (biocatalysis) to make products like enzymes or chiral intermediates. BASF has nearly three decades of experience in this field.

## **BASF**

The BASF Group's Intermediates division develops, produces and markets the world's largest range of intermediates containing more than 600 products. The most important of the division's product groups include amines, diols, polyalcohols, acids and specialties. Among other applications, intermediates are used as starting materials for coatings, plastics, pharmaceuticals, textile fibers, detergents and crop protectants. Innova-

tive intermediates from BASF help to improve the properties of final products and the efficiency of production processes. The ISO 9001:2000-certified Intermediates division operates plants at production sites in Europe, Asia, and the Americas. In 2007, the division generated world sales of about €2.5 billion with 2,600 employees. For more information, go to [www.basf.de/intermediates](http://www.basf.de/intermediates)

BASF is the world's leading chemical company: The Chemical Company. Its portfolio ranges from oil and gas to chemicals, plastics, performance products, agricultural products and fine chemicals. As a reliable partner BASF helps its customers in virtually all industries to be more successful. With its high-value products and intelligent solutions, BASF plays an important role in finding answers to global challenges such as climate protection, energy efficiency, nutrition and mobility. BASF has more than 95,000 employees and posted sales of almost €58 billion in 2007. Further information on BASF is available on the Internet at [www.basf.com](http://www.basf.com).