

# New artificial enzyme safer for nature

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Perilous and polluting industrial processes can be made safer with enzymes. But only a short range of enzymes have been available for the chemical industry.

Recently a group of researchers at The Department of Chemistry at University of Copenhagen succeeded in producing an artificial [enzyme](#) that points the way to enzymes tailor-made for any application.

With their group leader, Professor Mikael Bols, Ph.d. students Jeanette Bjerre and Thomas Hauch Fenger are publishing details of their breakthrough in recognized international *ChemBioChem* (15/2009) under the title "Cyclodextrin Aldehydes are Oxidase Mimics"

## Artificial enzymes for unnatural tasks

An enzyme unlike any seen in nature, this new one distinguishes itself in three ways. Its effect is powerful. It's easy to produce. And the researchers from the Copenhagen labs are the first to fashion an enzyme that is capable of speeding up oxidizing processes. With the simple and cheap compound [Hydrogen Peroxide](#) no less.

Oxidizing processes are considered one of the cornerstones of all chemical production. From paint to pharmaceuticals. But traditional oxidizers have a reputation for being dangerously unrefined. That's why enzymes are desirable and tailor made ones doubly so. For one thing they can be designed to be unbelievably specific. But even more important is their ability to operate under humane conditions, unlike their traditional

chemical counterparts, which often need high temperatures, extreme pressure and corrosive surroundings.

## New tool in the box

Until recently enzymes were exclusively found in micro organisms in the wild. But the challenges faced by [microbes](#) and chemical corporations are hardly comparable. So industries have been short on eco friendly alternatives to chemicals. The new artificial enzyme from Copenhagen adds a whole new class of tools to the toolbox of the chemists. And it's fast. Though not yet fast enough.

Natural enzymes typically speed up reactions by as much as 1 million times. The new enzyme from the Bols-group will speed up reactions by no more than 10.000 times. But that's not to be sneezed at says professor Mikael Bols.

"We have been developing these substances since year 2000. When we succeeded with the first enzyme, it's reaction speed was only multiplied by 25, so I think it's fair to speak of a breakthrough here", says the professor.

As the new enzymes inch closer to the natural reaction-times, they they are bound to become increasingly important for sensitive processes like those of the pharmaceutical industry.

Source: University of Copenhagen

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