

CHIMIA REPORT/COMPANY NEWS

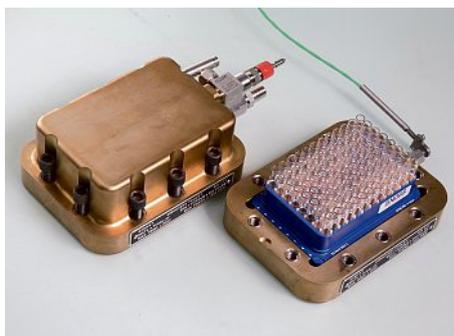
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Solvias' Ligands and Catalysts enable highly efficient commercial catalytic processes

Solvias is a world leader in contract research, development and manufacturing. The served industries include pharmaceuticals, biotech, medical devices and cosmetics.

The catalysis team at Solvias has been at the forefront of making the latest scientific findings available to the development of commercial catalytic processes. As a critical component in process development, Solvias relies on the highly efficient high throughput experimentation (HTE) platform. High throughput experimentation, combined with rational design of experiments (DOE), is a powerful tool for rapidly identifying reaction conditions that consist of multiple reaction parameters, all of which need to be screened and optimized.



metals like copper or nickel makes such transformations particularly attractive for industrial processes.

New Josiphos Nickel Catalysts

In order to advance the application of nickel catalysts in academic research as well as in industrial process development, Solvias has commercialized a series of air-stable Josiphos nickel catalysts in 2017. These single-component catalysts leverage the application of recently discovered Nickel-catalyzed C–N cross-couplings, especially under the employment of ammonia.

New Information Platform

Customers can now explore the wide application range of Solvias' modular ligand families in asymmetric hydrogenations, C–X bond couplings or even asymmetric C–C bond formations on the new information platform. In addition, the detailed expertise and know-how of the handling (stabilities, solubilities, reference spectra, experimental procedures, etc.) of the ligand and catalyst portfolio is compiled.

IP included

For commercial processes, all Solvias ligands are licensed without any general restrictions or further obligation such as custom production agreements. Ligands are sold with attractive IP models ranging from an 'all-inclusive' kg price (IP included) to a regular royalty-based licensing model. Small quantities of the ligands can be purchased from collaborating distributors (Sigma-Aldrich or Strem). Larger quantities can be ordered directly from Solvias.

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Readily Available Ligands and Catalysts

The usefulness of new catalytic methodologies for larger-scale production is closely associated not only with the streamlining of the process itself (catalyst loading, accessibility of key starting materials, temperature, safety, volume efficiency, etc.) but also with the commercial availability of catalysts consisting of precatalysts and ligands.

As the leading provider of ligands and catalysts for asymmetric catalytic transformations Solvias produces and commercializes a wide variety of chiral phosphine ligands and catalysts for use in catalytic asymmetric hydrogenation and many other asymmetric catalytic reactions. Several of these ligands/catalysts are used in industrial production processes. The most commonly used ligand families, Josiphos, Walphos, Mandiphos, Taniaphos and Ubaphox, are offered from gram to multi-kilogram (kg) quantities. Solvias' catalogue includes 11 ligand families with a total of 124 derivatives (R and S enantiomers). In addition the portfolio contains a variety of efficient C–X coupling ligands and catalysts.

From established to modern catalysis

While Solvias' ligands have proven highly efficient in asymmetric hydrogenations as their original field of application, they also enable high activity and selectivity in novel asymmetric catalytic reactions such as hydrofunctionalizations, reductive couplings and addition reactions. The readily availability of the catalyst/ligand system on large scale as well as the high catalytic activity under application of inexpensive



With this strategy, a large experimental space and serendipity can be explored. These tools have proven most successful in the development of various transformations such as asymmetric hydrogenation, asymmetric C–C bond formation, C–C and C–X cross-coupling, carbonylation, hydroformylation, classical racemic resolution or diastereomeric crystallization. The fast and cost-effective screening solution can enhance the route selection process for any chiral and non-chiral intermediate or API.

Guilt-free indulgence: Evonik launches low-calorie sugar substitute in Asia

Essen, Germany/Bangkok, Thailand. All the sweetness of sugar, but just half the calories: isomalt is a versatile substitute used in candies, chewing gum and other products. It is also suitable for diabetics. A joint venture between Evonik Industries and Thai company Rajburi Sugar, will be the first enterprise to manufacture isomalt in Asia. To this end, the partners have officially opened a demonstration plant in Ratchaburi (Thailand). The facility will employ a special, high-yield production process developed and patented by Evonik. Total investment is in the low single-digit million euro range.

As Christian Kullmann, Deputy Chairman of the Evonik Executive Board, explained at the commissioning ceremony: "Southeast Asia is an important growth market for Evonik. We aim to develop new markets with innovative products and solutions that truly benefit people. We are the first to manufacture the sugar substitute locally, and I am confident that we have a product with considerable potential."

Dr. Sunthorn Arunanondchai, president and CEO of C.P. Land and chairman of Rajburi Sugar, said, "I am very pleased that Evonik, as one of the world's largest specialty chemical companies, will produce the sugar substitute isomalt together with Rajburi Sugar in Asia. The joint venture pools our competencies. We supply the raw material and will put all of our effort into marketing

the product locally, while the innovative power of Evonik made the new demonstration plant possible in the first place." Rajburi Sugar is one of the key manufacturers of sugar in Thailand and for the entire region, and is increasingly engaged in producing low-calorie alternatives.

Demand for sugar substitutes is high in Asia, and incidence of diabetes and obesity is growing. Nearly one in ten Asians now suffers from type-2 diabetes, the most common form of the disease. Recent studies suggest this could double in the next 25 years. Consequently, there is a growing need for low-calorie foods, and confectionary manufacturers are increasingly turning to sugar-free products.

In contrast to other sugar substitutes, isomalt absorbs virtually no moisture from ambient air. Since it does not clump during manufacturing, or as an end product, sweets and other treats do not stick together – and therefore do not need to be packaged individually. Moreover, they fulfill consumers' high expectations in terms of aesthetics and health. Isomalt is tooth-friendly and only has limited bioavailability, translating into fewer calories – and less guilt when being indulgent.

Against this background, researchers at Creavis, Evonik's strategic innovation unit, have linked up with process technology

specialists to streamline the conventional isomalt production process. The new method comprises fewer steps, and employs biotechnology to raise the isomalt yield. Dr. Ulrich Küsthardt, Chief Innovation Officer at Evonik, emphasizes: "The new approach is the result of our ability to innovate and collaborate. Creavis initiated a successful project – that required the unit to work closely with experts from Evonik's operational segments and our Thai partner. The new demonstration plant is a further stepping stone towards establishing a new line of business based on advanced food ingredients."

The activities of Advanced Food Ingredients focus on natural food ingredients with scientifically proven health benefits, and on formulation technologies for targeted drug delivery. The latter ensure that active pharmaceutical ingredients (APIs) are taken up at the right location within the human body, at the right time. By leveraging its expertise in this field, Evonik can offer its customers solutions for high-quality dietary supplements and functional foods that ensure competitive differentiation.

The isomalt manufactured at the plant in Ratchaburi will be marketed in Southeast Asia by Evonik's Pharma & Food Ingredients Product Line and Rajburi Sugar under the brand name Risumalt® – and primarily for use in food and dietary supplements.

Source: www.evonik.com

DSM introduces high performance Anti-Soiling coating for solar cover glass. Same sun. More power.™

The new coating provides a unique combination of anti-soiling and anti-reflective properties, and is aimed specifically at PV modules in dry, desert-like climates. It delivers a performance win-win for the growing number of solar parks by securing highest module output, while simultaneously boosting electricity output further by reducing soiling losses from dust and dirt – traditionally a major challenge in arid conditions. DSM's Anti-Soiling coating brings direct performance improvements and indirect maintenance savings, boosting the Internal Rate of Return (IRR) of PV solar projects.

Same sun. More power.™

While solar energy has become a key part of the global energy mix over the past decade, more work is needed for it to increasingly become a global and financially viable alternative to fossil fuels – which essentially means reducing the levelized cost of energy (LCOE) of solar PV. The new AS coating aims to achieve this by boosting module output in the field; building on the success of DSM's industry-leading Anti-Reflective

coatings - which already deliver a 3% energy gain in flash tests.

Jan Grimberg, Global Business Director DSM Advanced Solar, said: "*In extensive testing at the TÜV SÜD desert test site in Dunhuang in China, we have shown that this new Anti-Soiling coating consistently outperforms our own industry leading Anti-Reflective coating in terms of power – each month more than 1% extra on average. The actual performance at the customer will depend on local conditions, including the type of soiling and climate conditions. We are convinced that by using this coating, the financial performance of PV parks in arid climates, the internal rate of return (the IRR) can be improved by the combination of higher energy output due to less soiling losses and reduced cleaning costs.*"

From test to commercialization

The new AS coating is based on DSM's proprietary core-shell sol-gel technology, which provides a high transmission gain. The coating composition has been modified to minimize dust adhesion while optimizing

dust removal. The product has been extensively tested by DSM, various leading institutes and module manufacturers, both in the lab and in outdoor test locations all over the world. DSM is now scaling up the AS coating to production size and the product is available for pilot scale testing. DSM is working with the world's leading PV solar glass manufacturer Flat Glass Group, based in Jiaxing City, Zhejiang, China, to supply DSM Anti-Soiling coated PV glass to module manufacturers.

Edwin Zhao, General Manager of FGG Solar PV Glass said: "*Over the last 20 years Flat has become a large-sized glass manufacturer with total assets of more than 4 billion Yuan and integrated research and development, manufacturing and processing facilities of glass. DSM and Flat have been cooperation partners for several years now and we worked closely on a variety of new product and new technology development activities. We are extremely proud to bring for the first time to the market solar modules coated with the innovative DSM Anti-Soiling coating, fulfilling an unmet need of our customers.*" Source: www.dsm.com