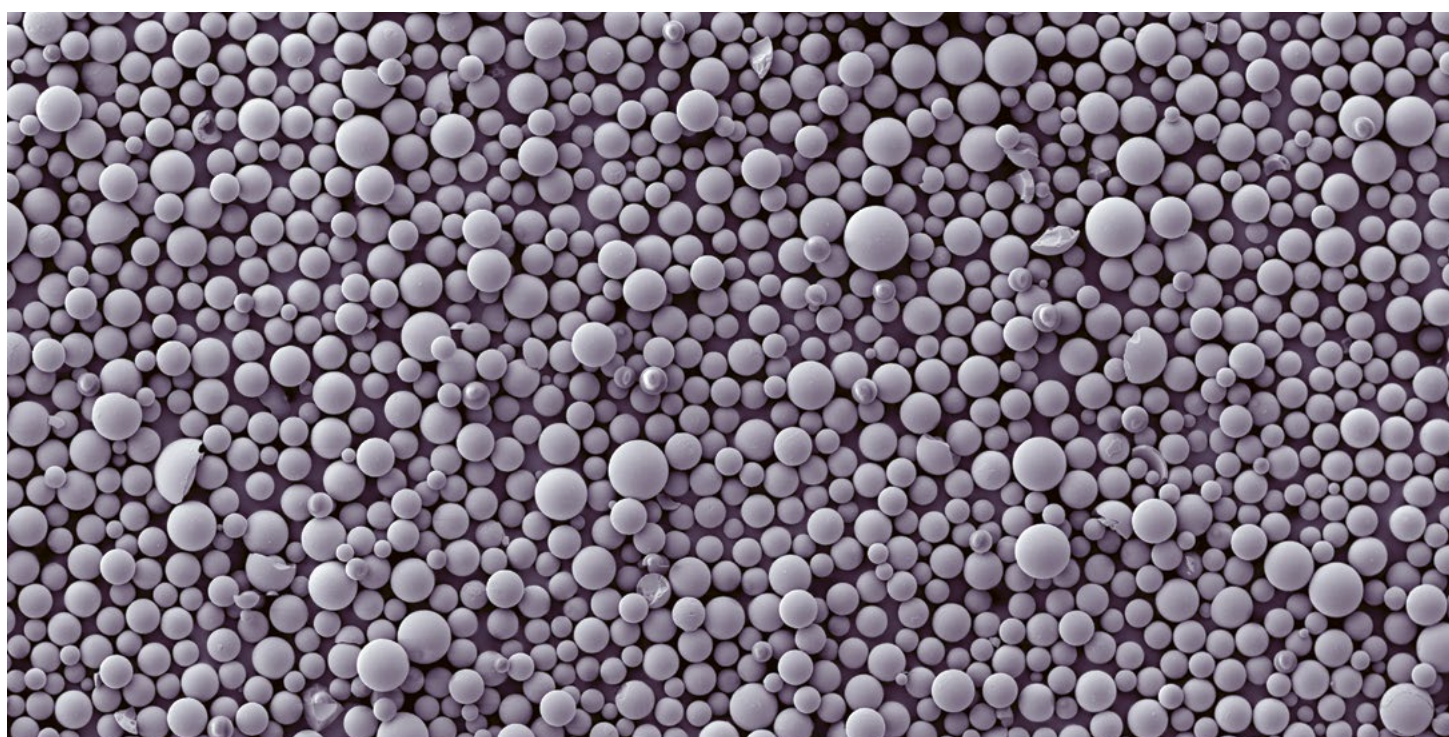


# A new paradigm for manufacturing silica gel

Zeochem is a leading producer of silica gel. The irregularly shaped gel is one of the world's most popular chromatography sorbents for filtering and/or purifying biopharmaceuticals, active pharmaceutical ingredients, nutraceuticals, beverages and cosmetics. Zeochem's silica gel is available in raw or coated form, and is produced using the company's own in-house technology. Zeochem can draw on a long tradition of silica gel manufacture, and has built up a correspondingly broad customer base in the pharmaceutical and the biopharmaceutical sectors.



A close-up of the irregularly shaped silica gel, which is used in the purification of various substances such as biopharmaceuticals

Zeochem is further expanding its portfolio of highly effective products with the launch of its own line of higher-performance spheroidal chromatography gels under the ZEObeads brand. The company is developing its own fully flexible manufacturing technology to produce the new line. It also aims to further enhance the ZEObeads line by diversifying its products' surface and pore structures, performance and applications. By cultivating its own production of silica gel beads using an innovative continuous procedure, along with the downstream production of silica acid, Zeochem can accelerate its product development while simultaneously maintaining full quality and pricing control.

The purity and quality of a silica gel are extremely important if it is to be used for substance separation (chromatography) purposes. Using

Zeochem gels instead of standard gels for such procedures will deliver higher efficiencies, longer material lives and lower production costs.

The new production process entails many challenges. More than 20 different process parameters influence the specific properties of the silica gel produced (its pore structure, surface and pore volume) and thus its chromatographic performance.

In view of this, Zeochem teamed up with the specialists at the Swiss Federal Laboratories for Materials Science & Technology (Empa) in 2023 to conduct this research and development project and further strengthen the company's position in the silicium dioxide market. Under current plans, the products of the new technology should be brought to market in the course of 2024.



Dr. Victoria Custodis, Head of Research & Development and Product Management at Zeochem (left), and Dr. Ana Stojanovic, project leader at Zeochem, with the reactor for the new production process

“This collaboration with Empa is a great way to blend industrial and academic expertise and give us all an opportunity for genuine innovation,” says Dr. Ana Stojanovic, the project leader on the Zeochem side. Dr. Wim Malfait, project leader at Empa, agrees: “The chance to fine-tune intrinsic parameters and the chance to manufacture a range of products for various markets – these are the two great opportunities that this project provides. But in the complex dependence of product performance on so many different parameters, the project faces some major challenges, too.”