

Ceramic Nanofibres as Catalysts

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Sustainable catalysts that can contribute to global Energiewende (phase-out of fossil and nuclear fuel) have been an established research topic at the University of Bayreuth for many years. Recently, Dr. Eranezhuth Wasan Awin from India has been strengthening interdisciplinary research work in this field. At the invitation of the Bayreuth Humboldt Centre, the young scientist is working on the development of metal modified nanocomposite fibres by electrospinning. As catalysts, the fibres stand to enable the production of "green" hydrogen from renewable raw materials as well as its storage.

Today, "green" hydrogen is considered a key raw material for the Energiewende. It is predominantly obtained by using the energy generated by solar and wind power plants for the electrolytic splitting of water. In order to be able to store or use the energy carrier hydrogen as needed, powerful catalysts are required. Dr. Eranezhuth Wasan Awin brings a high level of expertise in the field of ceramic materials to Bayreuth research work aimed at developing such catalysts. He is a research associate at the Indian Institute of Technology Madras ([IITM](https://www.iitm.ac.in/)), which is considered one of the most important South Asian universities in the field of natural sciences and engineering.

"We are very pleased about the close cooperation on the Bayreuth campus and have started to test promising new research ideas together. The cooperation will also help to further strengthen the scientific contacts between the University of Bayreuth and IITM," says PD Dr Günter Motz of the Ceramic Materials research group. "Researching the fundamentals for new catalysts that are recyclable and conserve valuable raw materials has been a focus of my research group for some time, which we now wish to intensify through the increased inclusion of ceramic materials," explains Prof. Dr. Rhett Kempe, holder of the Chair of Inorganic Chemistry II. The research stay of the young Indian scientist was made possible by a scholarship from the University of Bayreuth Centre of International Excellence "Alexander von Humboldt", in short: the Bayreuth Humboldt Centre.

Electrospinning for high-performance ceramic nano-composite fibres

Thin fibres measuring only nanometres, which are composed of different types of molecules and are therefore called nanocomposite fibres, are used today in a variety of industrial applications. In Bayreuth, Dr. Eranezhuth Wasan Awin is primarily investigating ceramic nanocomposite fibres produced by electrospinning. Fibres containing a ceramic framework of silicon carbonitrides (SiCN) and transition metal nano-particles embedded in them are particularly suitable for the catalytic control of reactions involved in the intermediate storage of hydrogen. These metals are, for example, copper, ruthenium or cobalt. The young scientist from [India](#) is aiming to specifically optimise the properties and structures of such nanocomposite fibres with regard to the catalytic effects envisaged. With this goal in mind, he is working on novel electrospinning processes that enable the precise production of the required fibre structures.

"State-of-the-art electrospinning technologies are successfully applied in very different research areas on the campus of the [University of Bayreuth](#). I am very pleased that I can use this excellent infrastructure and work together with scientists from very different disciplines - from inorganic chemistry to engineering sciences. Together we want to advance the development of innovative hydrogen technologies," says the Bayreuth Humboldt Centre grantee.

Read the [original article](#) on University of Bayreuth.