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## Aiming for Climate-neutral Chemistry - Launch of Leibniz Transfer Lab and New Research Group at LIKAT

A new laboratory for the development of CO<sub>2</sub>- and climate-neutral chemical processes has started work at the Leibniz Institute for Catalysis in Rostock. It is correctly called the "Leibniz Transfer Lab for Sustainable Energy and Material Transformations (LTLNES)" and enables, among other things, material syntheses and long-term tests of catalysts on a pilot plant scale as a bridge between laboratory experiments and industrial processes. LIKAT received a so-called small strategic expansion of the institute for the procurement and operation of the facilities. This expansion of the basic funding had already been approved by the federal and state governments.

LIKAT has now received the approval notice for funding of 1.25 million euros per year. The funds cover three quarters of the costs for the Transferlab totaling 1.7 million euros. The institute will raise the rest from its own funds.

The expansion of the institute also provides for a new thematic group, which is headed by LIKAT chemist Dr. Christoph Wulf and whose establishment is now also possible thanks to the decision. The aim of the research is to develop technologies that will enable the energy and recycling sector to dispense with natural gas, oil and coal in the future and switch to renewable raw materials. Dr. Wulf: "Ultimately, the vision is a circular economy that is CO<sub>2</sub>-neutral and does not endanger the climate or environment with sustainable chemical processes."



*Fig. 1: Dr. Christoph Wulf with Dr. Denise Heyl at a laboratory-scale Fischer-Tropsch plant. Catalytic processes for the production of liquid hydrocarbons from carbon dioxide and carbon monoxide are tested in this plant. Photo: LIKAT*

Among other things, his group will explore how the greenhouse gas CO<sub>2</sub> itself can be used as a starting material for chemical processes. For example, CO<sub>2</sub> and green hydrogen can be used to produce e-fuels. Together with department head Dr. David Linke, who also heads the technical center at LIKAT and has many years of expertise in the field of reaction technology, the team will plan and construct corresponding pilot plants.

Christoph Wulf wants to obtain the carbon dioxide for this from various sources, such as biogas and the atmosphere. The chemist is therefore planning to install his own capture plant and later develop further plants with cooperation partners that can run on so-called point sources, such as biogas plants.

There are also plans to produce green kerosene on the basis of green hydrogen and to produce green methanol cost-effectively and process it further, e.g. into marine fuel. The hydrogen is produced at LIKAT using green electricity from its own photovoltaic system by means of water electrolysis. Basically, this is the chemical industry's entry into climate-neutral production of higher-value hydrocarbons and chemicals, which supports Germany in its climate goals and helps to secure the industrial location.

Sustainable processes and technologies require completely new catalysts, the fundamentals of which are being researched by the world-renowned Leibniz Institute. As Dr. Wulf explains, CO<sub>2</sub> is an extremely inert gas that can only be combined with other substances to form new products by catalytic means. "That is our expertise!"

Christoph Wulf's thematic group can also draw on the results of the "Hydrogen Research Factory MV" project, which has been running since 2022 in collaboration with LIKAT, Rostock's Fraunhofer IGP and INP Greifswald. It will ultimately comprise eight positions.

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