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PRESS RELEASE

Pfeiffer Vacuum is a partner of the Kems^{4}Bats junior research group of the German Federal Ministry of Education and Research

- **More resource-efficient, sustainable production of lithium-ion batteries**
- **A better understanding of materials will make lithium-ion batteries safer and more efficient**
- **“NanoMatFutur” competition for young researchers, organized by the Ministry of Education and Research**

Asslar, Germany, June 28, 2021. Kems^{4}Bats is the name of a new junior research group of the German Federal Ministry of Education and Research that is being set up at the Hochschule Mannheim University of Applied Sciences supervised by Dr David Henriques. The aim is to enable more resource-saving, sustainable production of modern lithium-ion batteries and to make the batteries safer and more efficient. The Ministry of Education and Research is funding this project over the next five years to the tune of 1.6 million euros as part of the NanoMatFutur competition for young researchers.

Lithium-ion batteries are used in many different mobile devices, be it laptops, smartphones, high-performance tools or electric cars. Safe, high-performance lithium-ion batteries are essential for the expansion of electro mobility.

The scientific focus of this research group is determining the development of gas and heat. Gas can develop inside the battery for different reasons. One of these is the formation of a boundary layer on the anode (solid electrolyte interface). This is largely responsible for the efficiency and stability of the battery. Decomposition reactions of

the battery materials can also lead to significant gas and heat development. In the worst case, this leads to a so-called thermal runaway, which destroys the battery.

The Kems^{4}Bats research group will contribute to the development of safer, cleaner and more sustainable mobility. The project aims to use new experimental analysis methods to determine fundamental material properties of future battery materials for electro mobility.

This is where Pfeiffer Vacuum's special expertise in applications with analytical equipment for gas determination in the vacuum process comes into play. The company's analytical equipment ranges from modular mass spectrometers enabling high-speed measurement to complex analytical systems in the ultra-high vacuum to atmospheric pressure range.

"Science and technology play an important role in our ever-changing world. As a leading supplier of vacuum equipment in the scientific field, Pfeiffer Vacuum has decades of experience. We are proud to support scientific experiments and cutting-edge research. We are looking forward to an exciting and promising collaboration," says Andreas Schopphoff, Head of Market Segment R&D at Pfeiffer Vacuum.

The findings of the junior research group will also find its way the lecturing program at the Hochschule Mannheim University of Applied Sciences. To this end, Dr Henriques will offer a special elective course for students at the University. The course will be supplemented by specialist lectures given by members of the industrial advisory board that is supporting the project.

Find more information about analysis equipment here:
https://t1p.de/pfeiffer-vacuum-analysis-equipment

Caption: High performance Quadrupole mass spectrometer for detecting lowest gas concentrations

Find high-resolution images for download **here**.

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About Pfeiffer Vacuum
Pfeiffer Vacuum (stock exchange symbol PFV, ISIN DE0006916604) is one of the world's leading providers of vacuum solutions. In addition to a full range of hybrid and magnetically levitated turbopumps, the product portfolio comprises backing pumps, leak detectors, measurement and analysis devices, components as well as vacuum chambers and systems. Ever since the invention of the turbopump by Pfeiffer Vacuum, the company has stood for innovative solutions and high-tech products that are used in the Analytics, Industry, Research & Development, Coating and Semiconductor markets. Founded in 1890, Pfeiffer Vacuum is active throughout the world today. The company employs a workforce of some 3,300 people and has more than 20 sales and service companies as well as 10 manufacturing sites worldwide.

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