MARIAN MATEJDES

Institute of Inorganic Chemistry SAS

Project number
1258/02/02

Project duration
9/2022 - 8/2025

"The SASPRO 2 program creates an environment that allows you to transfer your ideas and skills to research activities that are fully managed by the given researcher. A huge benefit is seen not only in the implementation of the project itself, but also in the possibility of acquiring new skills, cooperation, and strengthening the position of Slovak science at the international level."

S A S P R O 2

BIOGRAPHY

Marian Matejdes is a Slovakian citizen, born in Šaľa, who attended undergraduate and graduate programs in Physical Chemistry at the Comenius University in Bratislava, where he also obtained his PhD degree in 2013. Until 2015, he conducted research at the Institute of Inorganic Chemistry, Slovak Academy of Sciences. Afterward, he obtained a postdoctoral JSPS fellowship, enabling him to continue research in the field of nanocomposite materials at Yamaguchi University under the supervision of Prof. Jun Kawamata. In 2017 he moved as a DFG postdoctoral fellow to the University of Bayreuth, where he continued his work on functionalized 2D nano-layered materials in the lab of Prof. Josef Breu. Currently, he is employed at the Institute of Inorganic Chemistry, Slovak Academy of Sciences, continuing his research activities in the field of 2D nano-layered materials.

PROJECT SUMMARY

Artificial photosynthetic systems based on photoactive molecules and quantum dots

The presented project deals with the development of a water-dispersible artificial photosynthetic system capable of capturing solar radiation on an area of several thousands of μm2 per particle and utilizing the gained solar energy within photodegradation, photo disinfection, or photocatalytic processes. The energy of the light radiation will be transported to a distance of several tens of μm via a non-radiative or radiative energy transfer mechanism to quantum dots located at the edge of the artificial antenna. After the funneling of the excitation energy to quantum dots, it is expected that this energy will drive at the quantum dot/H2O interface photoactive processes. Besides cadmium-based, it is aimed to develop simultaneously also indium- and zinc-based artificial photosynthetic systems having a much higher probability of being interesting for industrial/commercial applications.

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PUBLICATIONS

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