

Smart flow photoreactor to industrialize photochemical reactions



Timeline | 10/2022 to 4/2024



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Budget | 99.961,20 €



Call | Ajuts d'Indústria del Coneixement - Producte 2021

SUMMARY

Smart flow photoreactor to industrialize photochemical reactions (**PHOTOSCALE**) project aims to facilitate the industrial scale up of light-driven organic transformations towards a more effective and greener chemical industry. There has never been a bigger emphasis on 'green production' as there is right now. Thanks to the innovations in chemical technologies, leading industries are embracing the economic benefits and responsibility of going green. Light-driven chemical transformations are revolutionizing synthetic methods, water treatments, and even the synthesis of fuels from atmospheric gasses. However, commercially available flow-photochemical reactors are limited and not adapted to the current emerging fields of chemical research and industry. For instance, technological solutions for flow photochemistry do not cover the translation from the laboratory scale to the production plan with the same technology, which would be desirable to efficiently apply some photochemical transformations to industry. Moreover, current flow solutions only solve the needs partially; as a simple control of the light-intensity and the temperature is lacking, which results in poor experimental reproducibility. This poor control of the reaction parameters slows down the innovation and applicability of the newly developed synthetic methods in industry and scale-up. **PHOTOSCALE** project aims to valorize and commercialize a flow photochemical reactor platform technology for lightdriven reactivity from mg to kg scale by a modular approach, like lego-irradiation-blocks that can be assambled into bigger panels provide the necessary reaction flow footprint to simultaneously control light-intensity and temperature. **PHOTOSCALE** will simplify operation costs of medicinal chemistry & pharmaceutical companies as well as chemical research by bringing to the market a universal and scalable modular solution for photochemical reactivity in flow. Photoreactors technology is well-kwon at ICIQ, it has been already developed and tested for the last 7 years. Moreover, flow technologies have been explored for more than 14 years. Previous market studies indicate the great interest of potential end-users and stakeholders of high-light intensity flow photoreactors, with tight control over a large range of temperature and light-intensity working from mg to kg scale. The estimated total achievable market is larger than hundreds of thousands of potential customers from research groups to production plants.



Development strategy