



New process for efficient CO₂ capture by innovative adsorbents based on modified carbon nanotubes and graphene oxide



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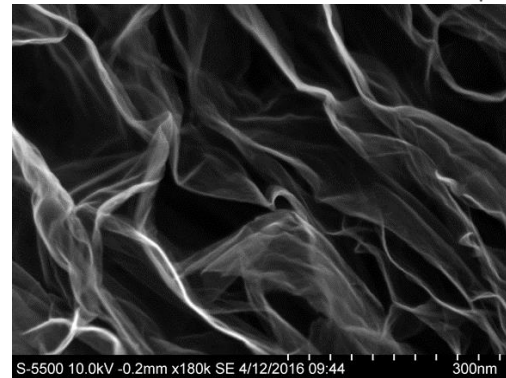
Dear readers,

the CARMOF project would like to share some updates with you in this newsletter. The CARMOF project develops Carbon Capture and Storage (CCS) technologies that make carbon capture efficient and cost-effective by the use of innovative CO₂ adsorbing materials at nanoscale (such as CNTs and MOFs) and 3D print them or make them into membranes for use in larger adsorbing units. The project is currently in its last year, having started in January 2018, and is funded under the European Commission's Horizon 2020 research and innovation programme.

Abalonyx develops rGO for CO₂ sorbents

Abalonyx is the only European supplier of graphene oxide (GO) and its derivatives such as reduced graphene oxide (rGO) in kg quantities and has a wide portfolio of customers from energy storage, composites, and coating industries as well as research laboratories from universities and institutes. We have been involved in 14 different International and Norwegian projects and our role in these projects has generally been to prepare and optimize our GO and GO-derivatives for the specific target applications of the projects, potentially leading to the establishment of future business relationships and new products.

Abalonyx is presently involved in CARMOF, a Horizon 2020 project, that aims to tailor-make 3D printed structures based on using carbonaceous materials such as rGO for efficient CO₂ capture. Due to the requirements of CARMOF, several new grades of rGOs have been developed so far and, finally, one of them was selected as the most suitable. This rGO is more electrically conductive and has a better compatibility with the ink development. Abalonyx is working on scaling up this product and hopefully, by the end of project, it could be launched in their portfolio.



SEM image of rGO

Nanocyl develops cost-effective, eco-friendly multiwall carbon nanotubes (MWCNT)

Within the CARMOF project, hybrid sorbent materials for CO₂ capture are being developed and 3D printed in monoliths. The sorbents are composed of a combination of polyethyleneimine, carbon nanotubes, metal organic frameworks and/or reduced graphene oxide.

Nanocyl, world leader of industrial production of multiwall carbon nanotubes (MWCNT), faces the challenge to produce a cost-effective and eco-friendly oxidized grade by thermal oxidation in air. The experiments are carried out in a continuous scale up unit, an inclined tubular rotative kiln similar to the industrial production unit. The best sample obtained so far after optimization presents 5% of oxygen content, with 500 g/day of production capacity. This product shows better compatibility with water according to the particle size distribution of aqueous dispersion. Nanocyl will scale up the composite production within the CARMOF project.



International workshop on CCU

CARMOF took part in the virtual IWCCU workshop held on the 16th and 17th February 2021. The two days of the workshop included talks and discussions on each project in detail. Highlights of the work performed in CARMOF were presented by the coordinator, Adolfo Benedito, in a presentation entitled “CARMOF Project: a CO₂ capture demonstrator based on membrane and solid sorbents hybrid process”.

It was the first ‘clustering’ event of its kind. The event pulled together more than 10 currently running NZE and non-INEA funded European sister projects on CO₂ capture and utilisation (see <https://iwccu.org/index.php/partners-sponsors> for details).



In addition, attendees and speakers from SPIRE (Processes4Planet in Horizon Europe) and a representative from the EC in Horizon Europe, alongside CO₂ Value Europe, Engie, ArcelorMittal, and the Northern Lights initiative were present. One of the aims of the workshop was to establish new relationships with relevant stakeholders across the CO₂ chain. The IWCCU workshop is expected to serve as a newly established platform for CARMOF’s sister projects to share their common topics of interest in the coming months.

CARMOF as part of annual multi-project initiative

Want to know more about the project?



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