

# 深地科学论坛（第六十三讲）：CO<sub>2</sub> “一步” 捕获及受控的矿化研究

时间：2023 年 9 月 15 日 14:30 - 16:00

地点：腾讯会议直播（ID 号：959-945-312）

报告人	报告人单位	报告题目
Veerle Vandeginste	比利时鲁汶大学	CO <sub>2</sub> “一步” 捕获及受控的矿化研究

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力学与土木工程学院

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## 报告人简介:



Veerle Vandeginste, 女, 比利时鲁汶大学材料工程系教授。曾任伦敦帝国理工学院(世界第6)地球科学与工程系独立研究员、比利时地质调查局和法国 CEREGE 科学家。在英国诺丁汉大学化学学院创建了地球化学研究团队, 随后出任比利时鲁汶大学材料工程系教授。主持了欧盟“地平线2020”研究计划资助的 SECURE 项目、英国自然环境研究理事会基金、比利时弗兰德研究基金等重大科研项目。其团队研究动力源于有限资源和全球变暖所带来的挑战, 研究重点是物质界面的物理化学以及它们与材料行为的关联。Vandeginste 教授在 *Nature Communications*、*Science Advances*、*Journal of Hazardous Materials* 等国际著名期刊发表学术论文 100 余篇。

## 报告摘要:

Integrated carbon dioxide capture and mineralization technology emerges as a promising solution to combat global warming during our efforts to transition towards renewable energy. Still, one of the significant challenges is the economic feasibility of carbon capture, utilization and storage. To overcome this hurdle, we advocate for the development of methods that capture carbon and yield high-value products. Our innovation lies in a one-step approach that captures carbon and produces functional carbonates through precise crystallization control. Drawing inspiration from the natural formation of nacre, we have devised a method for generating  $\text{CaCO}_3$  particles with diverse morphologies. This process involves a gas diffuser reaction setup, whereby  $\text{CO}_2$  is introduced into a liquid medium containing various reagents. These reagents include  $\text{CO}_2$  absorption promoters, crystal growth modifiers, and calcium ions. Our research encompasses the evaluation of multiple inorganic and organic  $\text{CO}_2$  absorption promoters, assessing their efficacy in facilitating the conversion to  $\text{CaCO}_3$ . Additionally, we have explored several polymers as crystal growth modifiers. The resulting functional carbonates possess the potential to serve in various applications, such as adsorbents for toxic elements, catalyst supports, or as components in functional composite materials.