

CO₂ Mineralization for *in situ* Storage and *ex situ* Enhanced Metals Recovery



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Bio

Valentina Prigiobbe is an assistant professor in the Department of Civil, Environmental, and Ocean Engineering at Stevens Institute of Technology since 2015. She graduated in Environmental and Territorial Engineering from the University of Rome Tor Vergata. She earned a Ph.D. in environmental engineering at the University of Rome Tor Vergata and a Ph.D. in process engineering at ETH Zurich on CO₂ mineralization. She was post-doc at The University of Texas at Austin in the Department of Petroleum and Geosystems Engineering.

Technology or focus area

- At Stevens, I lead the Process and Geosystems Laboratory (PGE Lab) and my group performs experiments and develops models for particulate processes and flow and transport in porous media with applications to energy, water, and urban hydrology.

Ideas, Interests, Concepts to be Explored

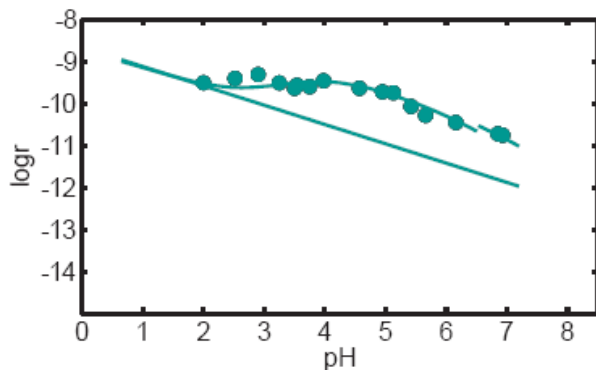
My interest are on **experiments and modeling** related to the following aspects of CO₂ mineralization:

- **Enhanced kinetics** of dissolution of mineral silicates and carbonates using enzymes, bacteria, and algae.
- CO₂ mineralization using **brines** such as mine drainage, produced water from oil/gas extraction and geothermal.
- **Recovery of metals** from silicate leachate and brines.
- Reuse of carbonates for the **growth of algae** for bio-fuel and bioplastic production.
- Reuse of carbonates in **building materials**.

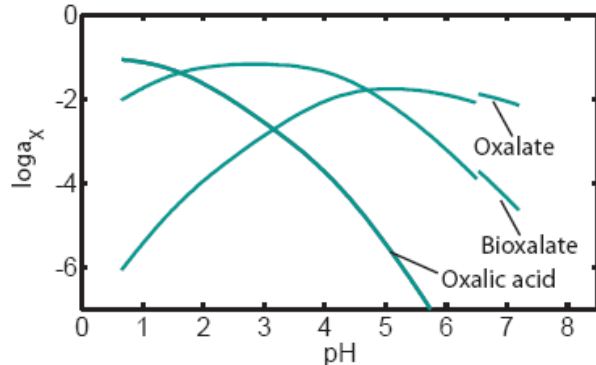
Previous work

Dissolution of olivine in the presence of oxalate, citrate, and CO₂

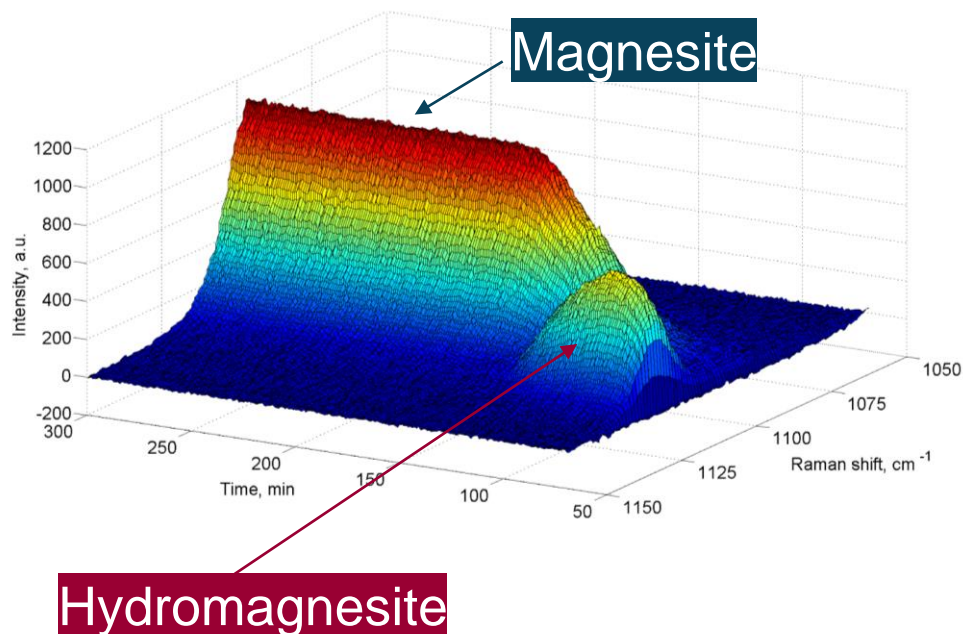
T = 90°C



Speciation of oxalic acid



Measuring and modeling the precipitation of Mg-carbonates



Prigiobbe and Mazzotti **2011** 66 6544–6554 *Chem Eng Sci*.

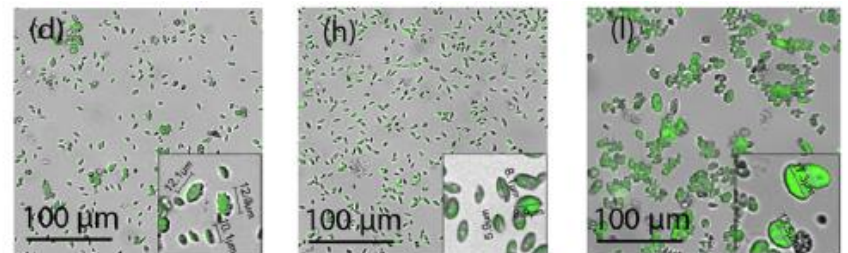
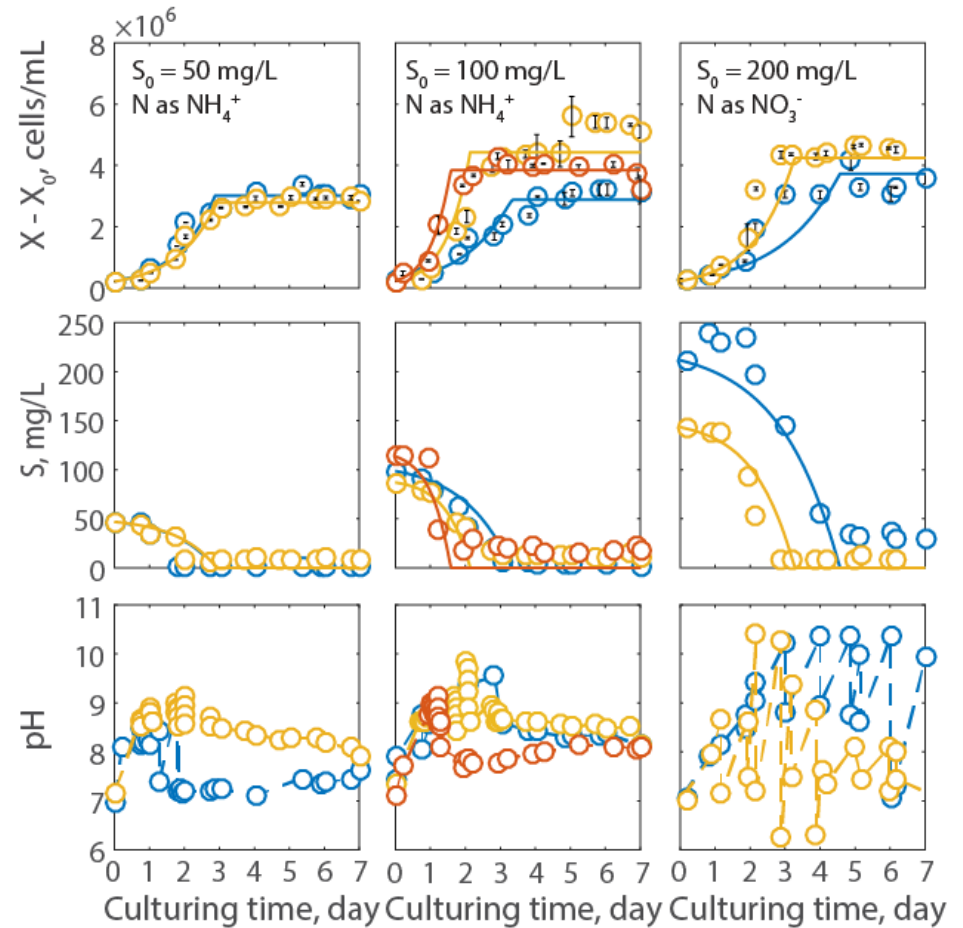
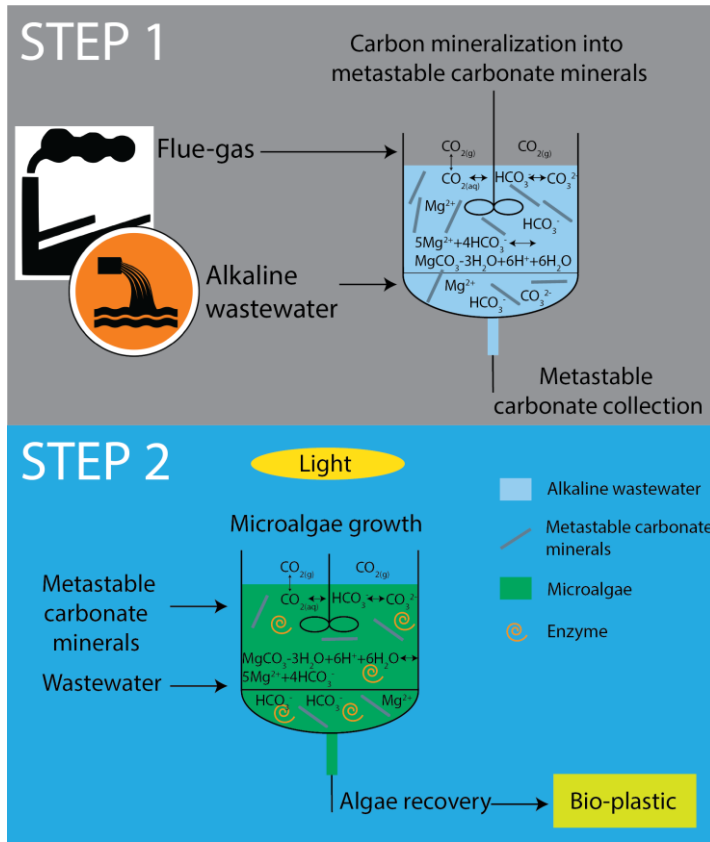
Hanchen et al. **2008** 63 1012-1028 *Chem Eng Sci*.

Prigiobbe and Mazzotti **2013** 223 755-763 *Chem Eng J*.

Prigiobbe **2018** 6 930–936 *J Environ Chem Eng*.

Previous work

Mineral Carbonation for Carbon Utilization in Microalgae Culture



Ye *et al.* 2019 33 (9) 8843–8851 *Energy & Fuels*.