

Ocean Acidification Mitigation: Calcium Recovery from Industrial Waste

One of the challenges of the 21<sup>st</sup> century is to move towards a circular economy. This is both for environmental reasons and economic ones, as globalization shifts most manufacturing to non-OECD countries, jobs will be required. At the same time, the industrial revolution is leading to significant waste generation and environmental consequences. One of the more significant is ocean acidification, a side effect of anthropogenic CO<sub>2</sub> emissions. This has long term ramification for coral reefs and the ocean food systems. Adding alkalinity (e.g. mafic rocks) is being considered as a mitigation option with some private companies (Planetary Hydrogen) in the space.

This project combines both circular economy and ocean acidification mitigation by recovering calcium from industrial wastes. A variety will be considered but the only evident one at scale is waste concrete. Waste concrete is the product of infrastructure renewal and globally is expected to be in the 40 billion tonne range. Recovering the calcium and producing a carbonate powder would allow alkalinity of the coastal regions while recovering sand for new buildings. This work will involve chemistry experiments to characterise Ca bearing compounds and then use an alkalinity swing to produce high purity carbonates.