



## STORAGE OF CO<sub>2</sub> FOR DEVELOPMENT OF NEW BUILDING MATERIALS FROM BY-PRODUCTS

*PhD Candidate:* Giada Biava

*Email:* g.biava@unibs.it

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*Tutor:* Professoressa Elza Bontempi



### Background

I master graduated in Chemical Science and Technologies at University of Milano Bicocca. I did two internships in organic chemistry based on formulation of new surfactants for micellar reaction in water and development of new multivalent chaperones. After master graduation, I have been worked for a year at Mario Negri Institute, Environmental and Health Department, as chemical analyst searching micro-organic and inorganic pollutants. In that period, I understood the importance to use my knowledge to develop new solutions for giving my contribution for a world less polluted.

### Objectives

My project is focus on develop an efficient strategy of direct carbonation of industrial wastes accelerating the reaction process. The carbonated products could be used as base for the development of new and innovative building materials.

### Methodologies

Experimental activity is going to consist in to study different industrial wastes and to characterize them by chemical and physical analysis. Chemical structure and composition are going to study by mass spectrometry, Total Reflection X-Ray Fluorescence (TXRF) and infrared spectroscopy (IR); physical structure by X-rays Diffraction (XRD) and Scanning Electronic Microscopy (SEM). Successively, different tests of carbonation are going to be done to find the best reaction condition using a reactor in collaboration with Italcementi Group.

### Expected Results and Impact

Studying results on literature, we could expect wastes from cement industries could give the best results in term of carbonation efficiency caused their high alkalinity and their instability. The most difficult step could be finding correct reaction conditions to accelerated the kinetic of the process. The impact of this project could be of great importance because the global warming and greenhouse gases are one of the main problem for humanity. Moreover, for Italcementi Group, it is fundamental find a strategy to storage and convert huge amount of CO<sub>2</sub> produced from cement processes every year.

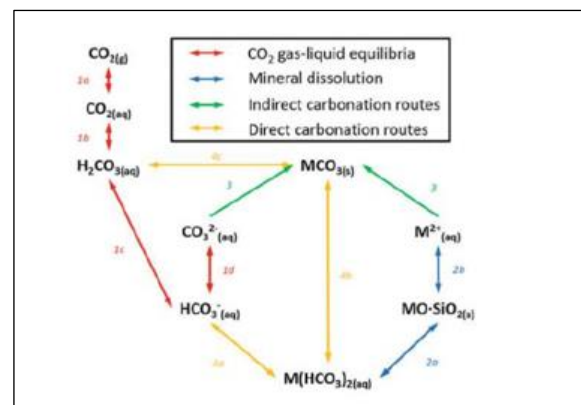


FIGURE 1. GENERAL SCHEME OF MINERAL CARBONATION PROCESS