CHEMICAL PROMOTERS AND MODIFIERS FOR THE MINERALIZATION OF CARBON DIOXIDE

The CO_2 capture and conversion processes are sustainable strategies for mitigating climate change and reducing the harmful impacts of greenhouse gas emissions. In this scenario, the carbon mineralization process stands out among several carbon sequestration methods. The production of calcium carbonate ($CaCO_3$), induced by a chemical reaction, can convert gaseous CO_2 into a solid and stable form. However, the efficiency of this process is influenced by different variables that include, but are not limited to, temperature, pressure, pH value, ionic concentration, and interfacial and/or surface tension between the fluids. This work studied the influence of nitrogen-based promoters and polymeric morphological modifiers on the conversion of carbon hydroxide + carbon dioxide into calcium carbonate and water. The preliminary results showed that the pH increase caused by the addition of nitrogen-based promoters favors the mineralization reaction. On the other hand, the higher concentration of promoter in the solution resulted in higher viscosity, which hindered the reaction. The XRD diffractograms confirmed the production of calcite crystals, the most stable ones for calcium carbonate. Also, the scanning electron micrographs confirmed the calcite morphology, which will be transformed into engineered shapes by the modifiers that will be used hereafter.