The mineralogical characteristics that influence the functionality of "The ÅA Route" –carbonation method

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Single geological and mineralogical characteristics found in different rocks directly influence a rocks suitability for mineral carbonation. Therefore, a detailed mineralogical characterization has been essential when aiming to develop "The ÅA Route" carbonation method. In "The ÅA Route" carbonation process, $Mg(OH)_2$ is produced from rock material and then reacted with CO_2 in an exothermic reaction that produces a magnesium carbonate, magnesite ($MgCO_3$) (Sjöblom and Eklund 2014).

Based on the results, the characteristics that need to be regarded are the crystal water- and the Mg-content in the minerals (Sjöblom and Eklund 2014), the crystal structure (Lavikko and Eklund 2015) as well as the composition of the parental rock (Sjöblom and Eklund 2015). Thus, the raw material should be an ultramafic rock with sufficient amounts of Mg (> 17 %) as well as crystalline H_2O (> 12.5 %). It should be a phyllosilicate descending from a phyllosilicate, as the remaining characteristics of the parent rock influence the functionality. The structural complexity and the location of Mg in the lattice are significant factors to the successfulness of a rock. Unexpectedly, the grade of metamorphosis was not a factor for the net productivity. However, it had a negative influence in the preparation of the raw material.

Based on their successfulness in "The ÅA Route", different rock types and minerals are stated as suitable, with reduced suitability or as unsuitable.

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