

**UTILIZATION POTENTIAL OF ULTRAMAFIC ROCKS IN AUSTRIA IN VIEW OF HYDROMETALLURGICAL PROCESSING AND MINERAL CARBONATION**

Treimer, R.<sup>1</sup>, Melcher, F.<sup>2</sup>, Moser, P.<sup>1</sup>, Niesenbacher, I.<sup>3</sup>, Lehner, M.<sup>3</sup> & Höllen, D.<sup>4</sup>

<sup>1</sup>Chair of Mining Engineering and Mineral Economics, Montanuniversität Leoben, Austria

<sup>2</sup>Chair of Geology and Economic Geology, Montanuniversität Leoben, Austria

<sup>3</sup>Chair of Process Technology and Industrial Environmental Protection, Montanuniversität Leoben, Austria

<sup>4</sup>Chair of Waste Processing Technology and Waste Management, Montanuniversität Leoben, Austria

e-mail: robert.treimer@unileoben.ac.at

Anthropogenic carbon dioxide emissions are the main driving force for global warming, therefore the reduction of these emissions is indispensable in order to mitigate the threatening climate change with all its ecological, economic and social consequences. An important approach for mitigating CO<sub>2</sub>-emissions is the use of CO<sub>2</sub> as feedstock for the production of carbon-based products (CCU-carbon capture and utilization). One of the most interesting CCU-options in future is mineral carbonation (MC), which offers the possibility for sequestration of CO<sub>2</sub> in form of synthetic carbonates based on the fundamental principle of the reaction of CO<sub>2</sub> with Mg or Ca and the formation of the corresponding carbonates which can be applied as industrial minerals or construction materials.

Mg-rich ultramafic rocks, such as peridotites, dunites or serpentinites are the main primary resources for the MC-technology. By means of hydrometallurgical processing (HP) primary rocks are separated into their compounds, such as magnesium, silicates (leaching residues) and metals (Fe, Ni, Cr, Al, Mn, Co). Subsequently, Mg is carbonated with captured CO<sub>2</sub> under formation of synthetic magnesium carbonate.

The most important deposits of peridotites and serpentinites in Austria occur in the Speik Complex in Styria, especially at Kraubath and Pernegg. In the scope of this study, selected samples of these deposits will be investigated particularly in view of the utilization potential for hydrometallurgical processing and mineral carbonation. The mineralogical and mineral-chemical aspects of the primary rocks as feedstock for HP and MC, as well as the mineralogical and mineral-chemical composition of the mineral fractions from the process technology will be investigated by means of optical microscopy, electron microprobe and scanning electron microscopy.

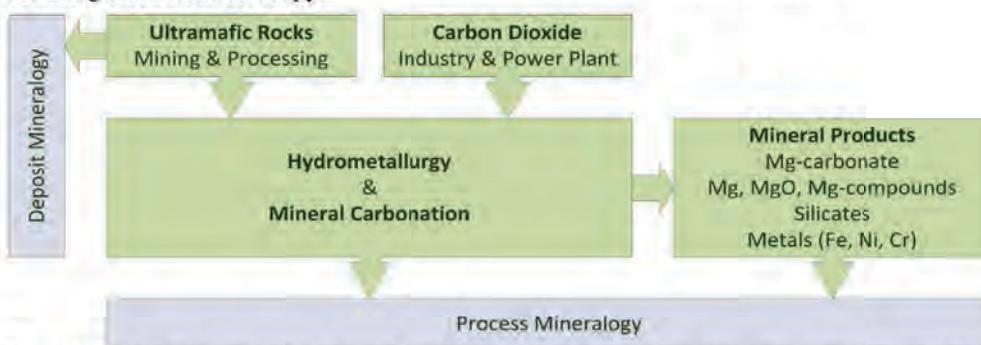


Figure 1. Principle of utilization of ultramafic rocks for hydrometallurgical processing and mineral carbonation and corresponding mineralogical investigations.