

MINERALOGY AND LEACHABILITY OF AUSTRIAN ROCKS USED IN ROAD CONSTRUCTION

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Natural rocks and recycling materials compete with each other as aggregate for road construction in Austria. Recycling materials like slags or construction and demolition waste must fulfill the requirements of the Austrian Recycling Building Materials Directive, whereas natural rocks are not obliged to fulfill these requirements. Consequently, data regarding the leachability of rocks used in road construction are scarce (e.g., TOSSAVAINEN & FORSSBERG, 1999) and not available for Austrian rocks.

In this work the mineralogical composition and leachability of four Austrian rocks used in road construction are investigated. X-ray diffraction (XRD) including Rietveld refinement could not confirm the presence of stoichiometrically heavy metal bearing phases (e.g., chromite, FeCr_2O_4). This is due to the detection limit of this method of about 2 wt.-% and possibly due to the incorporation of heavy metals in other phases; e.g., Ni was confirmed in lizardite ($\text{Mg}_3\text{Si}_2\text{O}_5(\text{OH})_4$). Inductively coupled plasma mass spectrometry (ICP-MS) indicates that the total contents of most heavy metals are underneath the limit values of the Austrian Recycling Building Materials directive, but the investigated serpentinite exceeds the limit values of Cr and Ni for the quality class U-A by more than one order of magnitude. However, leaching tests of this rock according to EN 12457-4 indicate, that besides Ni it is not Cr, but Cu which exceeds the limit values in the leachate (Fig. 1).

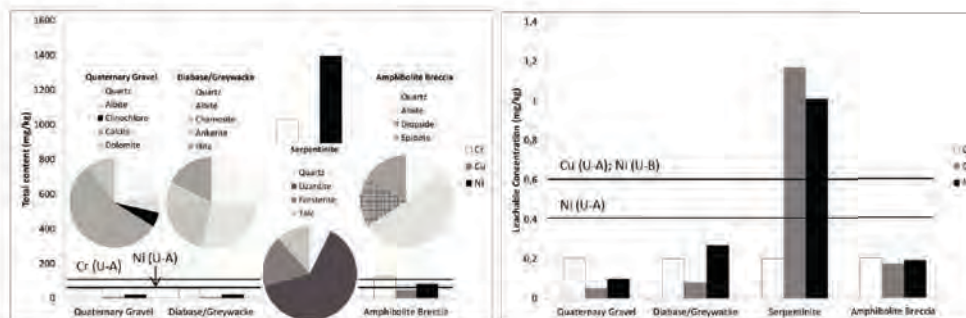


Figure 1. Comparison of total (left) and leachable (right) content of heavy metals from Austrian rocks with limit values for the quality classes U-A and U-B from the Austrian Recycling Building Materials Directive.

ALTENBURGER, I. (2015): Mineralogie und Auslaugbarkeit natürlicher im Straßenbau eingesetzter Gesteine Österreichs. Master Thesis. Fachhochschule Technikum Wien.

TOSSAVAINEN, M., FORSSBERG, E. (1999): The Science of the Total Environment 239, 31-47.