

## **Petrographic characterization and laboratory tests in the assessment of alkali aggregate reaction in Portuguese volcanic aggregates**

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### **Abstract**

In Portugal, volcanic rocks are commonly used as aggregates for concrete in Madeira and Azores islands and in a lower extent in the mainland. Nonetheless, the information about the potential alkali-silica reactivity of Portuguese volcanic rocks is rather scarce. In order to fulfill this lack of information and in the scope of the Portuguese research project IMPROVE (Improvement of performance of aggregates in the inhibition of alkali-aggregate reactions in concrete) six volcanic lithologies used as aggregates were investigated. For this purpose, petrographic characterization (polarizing microscopy and Scanning Electron Microscopy with Energy Dispersive Detector (SEM-EDS) and bulk chemical analysis were carried out. In the present work, the results of this preliminary investigation are presented aiming the identification of potential reactive features according to RILEM AAR-1 and the Portuguese Specification LNEC E 461. A comparison with other case studies of alkali-reactivity of volcanic rocks in the world is made with special reference to Japan, Iceland, Turkey and New Zealand, where the reactivity has specially been attributed to the chemical/mineral composition and the presence of SiO<sub>2</sub> rich glass in the volcanic rocks.