



## **Colour Changes on the Surface of the Rock Materials Due to UV-A and UV-B Rays**

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The colour of the rocks used in the current buildings, and historical monuments is an important parameter in architecture and engineering. In addition, engineering geologists use the colour in order to identify the weathering class of rock material. The main colour of the stone, especially, are affected by the mineral size, the colour of the primary minerals and matrix material, as well as the colour of the accessory minerals. Due to atmospheric effects, changes in the outer surface colour of the rocks used as siding materials occur with over time. Factors causing the colour change are carbon dioxide ( $\text{CO}_2$ ), ozone ( $\text{O}_3$ ), sulphate ( $\text{SO}_2$ ,  $\text{SO}_3$ ) and nitrate ( $\text{NO}_x$ ) from the atmosphere with aerosols as well as UV rays from the sun. There is no more work in the literature on colour changes caused by UV-A and UV-B rays. In this study, the effects of ultraviolet in the colour of the surfaces of basalt, limestone, ignimbrite, travertine and sandstone have been simulated with a new experimental device in the laboratory medium. Lutron colour analyser (RGB-1002) was used for the measurements of RGB colours. Colour differences between the beginning and end of tests were determined with the standard practice for calculation of colour tolerances and colour differences from instrumentally measured colour coordinates (ASTM D2244). As a result of the experiments performed, lighten that seem on dark-grey micritic limestone (colour change ratio, CCR: 17.06) and basalt samples (CCR: 8.24) become even visually noticeable. Black and red ignimbrite samples having high porosity were presented the lower rate of colour changes. Finally, colour darkening has been observed in the light-coloured travertine (CCR: 13.8) and sandstone samples (CCR: 20.99).