

Classification of White Marble Varieties by Monocrystal X-ray Diffraction

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A classification of white marble which was not influenced by human evaluation is of paramount importance for the Spanish marble industry and in particular for the industry of the Spanish area of Macael (Almería). The Macael-marble is characterized by a nice white color linked to interesting mechanical properties for building that have provided to this class of marble to be a very appreciate material used for centuries in a large variety of Spanish and American palaces for example the Alhambra of Granada. Instead of the economical and cultural importance of this material, no instrumental procedures were developed to differentiate and classify the Macael-marbles from others white marbles characterized by less convenient building properties. As a result of the research collaboration between the “University of Almería-Servicio de rayos X” and the “Centro Tecnológico Andaluz de la Piedra” (CTAP) a new procedure for marble analysis has been obtained. The method basically consists in determining the cell dimensions of the marbles by monocrystal X-ray diffraction. The analysis and comparison of evaluated marble cell parameters led to a reproducible procedure which provides an easy, fast and economical method to a selective identification and classification of the Macael-marbles and of the white marbles in general.

Keywords: white marble, monocrystal x-ray diffraction, marble classification