

Ceramics and Composite Materials

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Development of glass-ceramics glazes formulated from industrial residues

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In order to revalorize industrial residues such as glass cullet waste, chamotte from defective tiles or fly ashes from a coal thermal plant, some compositions precursor of glass-ceramic materials have been formulated, using the diagrams used for the design of ceramic materials synthesized by peturgic method (Gingsberg, Raschin-Tschetverikov and Lebedeva diagrams). The typical instrumental techniques (XRD, XRF, DTA/TG, dilatometer, particle size distribution by laser diffraction and heating microscope) have been used in order to characterize waste and compositions. Then, the TTT diagram (Time-Temperature-Transformation diagram) of each composition have been studied to find the optimum conditions to get the glass-ceramic glaze in the firing cycle of the porcelain stoneware tiles. Finally, the mechanic, chemical and magnetic properties have been studied in each case.

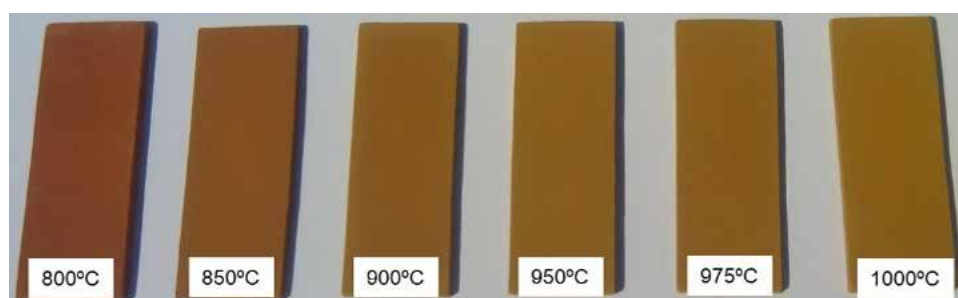


Figure 1: Glass-ceramic tiles formulated from industrial residues and fired at different temperatures to produce the devitrification of the precursor glass.

Biography

Ester Barrachina worked in R&D in Minera Sabater S L (2000-2004) and dedicated to the exploitation of white clays for the ceramic sector. She is the R&D Director in Tierra Atomizada S A (2004-2012) and producer of spray-dried powder for the ceramic tiles industry, where she developed her Doctoral thesis totally focused on the industry. Since 2013 until now, she is a Researcher in the Research Group of Solid State Chemistry in the Department of Inorganic and Organic Chemistry of Universitat Jaume I, led by the full Professor Juan B Carda Castelló. Her research is focused on the development of ceramic and glass-ceramics materials from industrial residues as recycled glass, ceramic chamottes, ashes from the thermal power station, etc., in order to revalue them. She is an author of several articles published in scientific journals such as *Ceramics International*, *Bulletin of the Spanish Society of Ceramics and Glass*, *Materials Letters*, etc.

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