

Inertization of Industrial Wastes by the Vitrification Technique

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This paper deals with the study of the vitrification mechanism as an inertization method for industrial wastes contaminated with heavy metals. Ashes from coal (thermoelectric), wastes from mining (fluorite and feldspar) and plating residue were used to compose vitreous systems planned by mixture design. The chemical composition of the wastes was determined by XRF and the formulations were melted at 1450°C for 2h using 10%wt of CaCO₃ (fluxing agent). The glasses were poured into a mold and annealed (600°C). The characteristic temperatures were determined by thermal analysis (DTA, air, 20°C/min) and the mechanical behavior by Vickers microhardness. As a result, the melting temperature is strongly dependent on silica content of each glass, and the fluorite residue, being composed mainly by silica, strongly affects T_m. The microhardness of all glasses is mainly affected by the plating residue due to the high iron and zinc content of this waste.

Keywords: cellular ceramic, vitreous waste, recycling.