

Evaluation of the final destination of ceramic matrices with residue addition

P.P. Silva^{1,*,#}, F.S. Lima², V.N. Simões³, A.L.F. Brito⁴, A.C.S. Muniz⁵, J.M.S. Neto⁶

^{1,2,3,4,5}Laboratory of Environmental Management and Waste Treatment – LEMWT, Academic Unit of Chemical Engineering, Federal University of Campina Grande, Campina Grande, Paraíba, Brazil.

⁶Laboratory of Biochemical Engineering – LBE, Academic Unit of Chemical Engineering, Federal University of Campina Grande, Campina Grande, Paraíba, Brazil.

#Corresponding author: ppinheiroeq@gmail.com

The leather industry produces an average of 54 to 78 tonnes per week of hazardous waste. The concern is discarding inappropriately, due to the high cost for the correct destination. An alternative treatment is the stabilization by solidification, which promotes the incorporation of the residues in cementitious matrices. This study aims to determine the best allocation of stabilized and solidified material from the experimental data obtained by factorial design with two factors (curing time and percentage of sludge). Being adopted 7 and 28 days of curing and 5 and 20% of tannery sludge, a total of four experiments in factorial points. Testing bodies based on simple Portland cement, sand, gravel and sludge were made, which were submitted to compression strength tests, which is essential to certify the integrity of the material in the final disposal stage. Subsequently, the obtained data were evaluated and modeled using the *Minitab 17.0 Software* that determined the percentage and time relationship, significant at the 5% probability level. At maximum levels, 28 days and 20% of sludge, the percentage resistance was minimal, and for the time the resistance was maximum in the analyzed range. Since the value of P in relation to percentage and time are zero, then the factors are significant with 99% confidence. Testing bodies with factors 20% and 7 days presented a resistance of 3.3MPa, according to the protocol of Brito (2007), this can be used as base material in paving as solid brick. Testing bodies with factors of 5% and 7 days, and 20% and 28 days, have applicability as a block cast in common concrete, whereas the test for 5% and 28 days that presented higher resistance to compression (16.9 MPa) can be used as thermofixed material.

[1] A. Brito, Protocol for the evaluation of materials resulting from stabilization by solidification of waste. 2007. 179 f