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ANALYSIS OF THE GROWTH CURVE FOR THE USE OF THE REJECT OF GRANITE ROSA IRACEMA IN THE MANUFACTURE OF EXIT FUNNELS IN THE TEXTILE INDUSTRY

Joseanne Alves de Sousa[1(*)], Jorge Luiz Cardoso[2], Cândido Jorge de Sousa Lobo[3]
[1]Federal University of Ceará, Russas, Brazil
[2]Department of Metallurgical and Material Engineering, Federal University of Ceará, Fortaleza, Brazil
[3]Federal University of Ceará, Russas, Brazil
[(*)]*Email:* joseannealves@alu.ufc.br

ABSTRACT

This work analyzes the viability of the use of the Rosa Iracema Granite waste as raw material for the production of rotor spinning funnels used in the textile industry. Eleven percent mixtures of tailings and Al2O3 (alumina) were analyzed with 48 specimens in total, sintered at temperatures of 1200, 1300, 1400 and 1500 ° C. The tests allowed to identify the percentage and the proper sintering temperature for the use of the waste in the funnels.

Keywords: reject, textile industry, gresification.

INTRODUCTION

The ornamental stone industry produces waste during the beneficiation process in the form of abrasive pulp rich in Silica (SiO2), Alumina (Al2O3), Hematite (Fe2O3) and Calcium Oxide (CaO) (Neves, 2002). This pulp, called mud, causes water pollution and silting rivers adversely affecting animal and plant life in the environment (Menezes, 2002). Some previous research has pointed out possible solutions to this problem by using granite residues as a substitute for synthetic ceramics (Cordeiro, 2003). A total of 48 tests were performed with 11 percent mixtures with Rosa Iracema granite and alumina. The granite residue was collected in Serra do Barriga, state of Ceará. The RC HTP DBM alumina from the Reynolds manufacturer was used as reinforcement and as a binder, 10 ml of water was added to each 60 g of Granite-Alumina blend. The specimens were pressed in cylinder form with an average height of 10mm and sintered at 1200, 1300, 1400 and 1500 ° C. The analysis of the gresification curve, carried out to make feasible the use of the Rosa Iracema granite residue in the textile industry exit funnels is illustrated by the combination of linear retraction and water absorption data following the ABNT NBR 9623 and ABNT NBR 15270-3: 2005 standards, respectively.

RESULTS AND CONCLUSION

The results for temperature of 1200 ° C and 1500 ° C are depicted in Figures 1 and 2. Table 1 shows water absorption and linear shrinkage results for the sample of 30% and 40% w of Al2O3, sintered at 1300 ° C 1400 ° C.

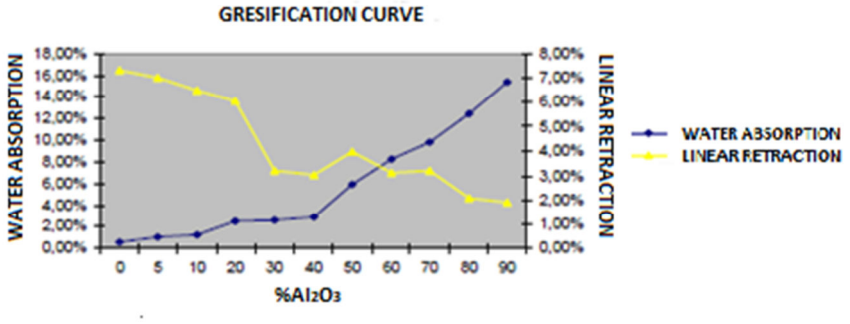

Fig. 1 - Gresification curve of the composite at a temperature of 1200 ° C

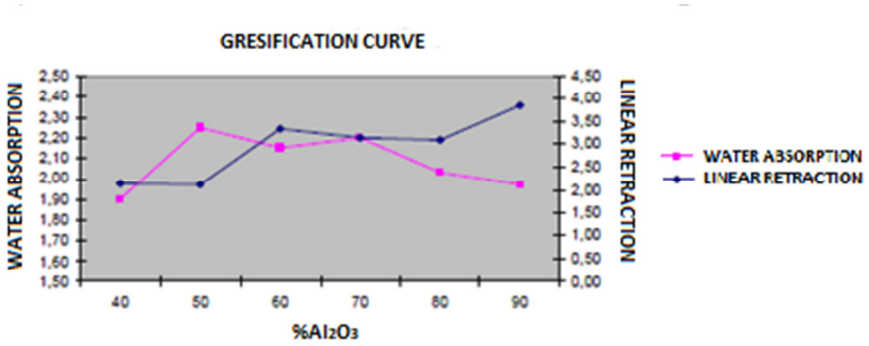

Fig. 2 - Gresification curve at 1500°C

Table 1 - Water absorption and linear retraction for sample with 30% w in Al2O3 with sintering at 1300 ° C and 1400 ° C

Sintering temperature	Water absorption (%)		Linear retraction (%)	
Reinforcement percentage	30%	40%	30%	40%
1300°C	2.26	2.16	2.89	2.96
1400°C	2.12	2.08	3.10	3.09

The most significant results were obtained in compositions of 30% and 40% alumina sub-micrometric by weight and sintered at 1500 ° C, as they presented results close to those obtained with imported funnels available in the market and manufactured with noble materials.

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