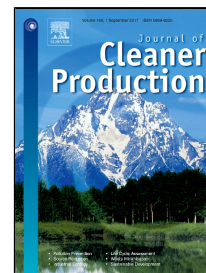


Accepted Manuscript

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PII: S0959-6526(17)31399-9
DOI: 10.1016/j.jclepro.2017.06.230
Reference: JCLP 9980
To appear in: *Journal of Cleaner Production*
Received Date: 25 February 2017
Revised Date: 26 May 2017
Accepted Date: 26 June 2017

Please cite this article as: Vsévolod Mymrin, Marília A. Guidolin, Walderson Klitzke, Kirill Alekseev, Reinaldo H. Guidolin, Monica A. Avanci, Urivald Pawlowsky, Edgar Winter, Rodrigo E. Catai, Environmentally clean ceramics from printed circuit board sludge, red mud of bauxite treatment and steel slag, *Journal of Cleaner Production* (2017), doi: 10.1016/j.jclepro.2017.06.230

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Environmentally clean ceramics from printed circuit board sludge,
red mud of bauxite treatment and steel slag

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ABSTRACT

The main purpose of this study was the development of new ceramic composites from three industrial wastes: printed circuit board, red mud from bauxite processing and steel slag, completely replacing clay and sand as traditional natural raw materials. Rectangular test specimens with 20 x 60mm in size were compacted with 3 MPa pressure, dried and sintered at temperatures of 1000°, 1050°, 1100°, 1150°, 1200°, 1250° and 1275°C for 3 hours. The resulting ceramic flexural strength was 15.39 MPa; water absorption ranged between 4.47 – 38.45%; linear shrinkage, between 1.17 and 16.90% and bulk density, from 2.10 to 2.56 g/cm³. The leaching and solubility tests show a reliable bonding of all metals until a level far above the requirements of Brazilian sanitary standards.

Keywords: printed circuit board; chemical interaction; heavy-metal binding; environmentally clean materials.

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