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Innovative carbon-bonded filters based on a new environmental-friendly binder system for steel melt filtration

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Abstract:

New carbon-bonded alumina filters for steel melt filtration were developed. The carbonaceous matrix was based on a new, environmental friendly binder system based on lactose and tannin. The filter preparation was analogous to the production of conventional foam filters according to the Schwartzwalder process. The processing as well as the rheology of the slurries was investigated. An addition of n-Si increased the carbon yield and the cold crushing strength (CCS) of the samples. Higher values of CCS were obtained after coating of the filters with alumina. The material was characterized by scanning electron microscopy, X-ray diffraction and Raman spectroscopy. The applicability of these new filters was assessed in impingement tests with a steel melt, in which three out of four recipes survived the thermal shock.