

Amorphous silica extracted from rice husks and obtained by acidic prehydrolysis and calcination: Preparation route and characterization

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The technological and industrial development of modern society has brought about a series of significant improvements for the population regarding infrastructure and environmental, extractive activities. However, the same development which provides improvements for the population also generates new challenges for society, such as the environmental maintenance and the reuse of solid waste. This paper presents the characterization of three kinds of silicas produced by three different routes of preparation (PH, C and B) in order to replace traditional Commercial Silica (Z), widely used in the Industry of Elastomer [1]. The PH Silica was obtained by acidic prehydrolysis of rice husks. The C and B Silicas are typical ashes of rice husks commercialized as amorphous silica of rice husks and Z Silica was obtained from quartz sand. The morphological assays identified morphologically different products due to the different routes of preparation. C and B Silica presented well defined and irregular grains, while PH and Z Silicas presented an agglomerate formation of particles, as well as high area and surface porosity. Based on the grain-size assays, the average size of particles were equal to 47.2, 6.2, 21.9 and 13.4 μm for PH, C, B and Z Silicas respectively [2]. From the analyzed material, the Z and PH Silicas were the ones which provided higher potential for processing and dispersion because their surface area was smaller than 200 m^2/g and DOP absorption higher than 235 $\text{mL}/100\text{g}$. Thus, the results point to a satisfactory potential for the use of PH Silica as an option to replace commercial Z silica, in addition to the possibility of adding value and allowing an environmentally acceptable disposal of the abundant waste produced by the industry of rice processing.

Keywords: Rice husk Silica, Silica Morphology, Comparison among Silica and reuse of waste.

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