Converting Waste Agricultural Biomass into a Resource. How a Rice Miller an Earn Extra Income in Extraction of Ultrapure Silicon from Rice Husk Ash Project

Description:

Rice Husk, generally considered as agricultural waste, is mainly used for energy generation, and also used as raw materials to develop technological products such as high purity silica ash, silicon carbide and zeolites. A major inorganic component of RICE Husk is silica (about 20-30 wt. %). Upon leaching with mineral acid and calcination, silica with high purity in amorphous form could be extracted from RICE HUSK. In the past few years our group used ricse husk silica (RICE HUSKS) in the synthesis of different kinds of zeolites including NaY, BEA, MOR, and mesoporous MCM.

Rice Husk a, derived from burning of Rice Husk is also an agricultural excess. Rice Husk a is generally used as soil ameliorants to help break up clay soils and improve soil structure but is also used as silica source as an insulator in the steel industry and as a pozzolan in the cement industry. Being less carbonaceous, Rice Husk a could be easily coursed through heat-treatment to extract amorphous silica.6,7 In another couple of studies, Rice Husk a containing crystalline tridymite and ?-cristobalite was used as an alternative silica source for the syntheses of BEA and ZSM-5 zeolites. A work characterized the ash produced from combustion of Rice Husk in fluidized bed reactor showing speed and continuity of the process.

Impurity optimized silicon is needed for the advancement of terrestrial photovoltaic power generation. Producing solar grade silicon from Rice Husks has been pursued. An integrated process flowsheet was developed and practiced that included initial leaching, reduction of Rice Husk ash (RICE HUSKA) and post-reduction purification of silicon. Metallothermic reduction of purified RICE HUSKA with magnesium was investigated within the temperature range of 500-950ºC. The reduction product was purified by two stage acid leaching sequence. Analysis of the final silicon powder product by XRD and ICP-OES showed crystalline silicon with boron content to be less than 3ppm- corresponding to reduction by a factor greater than 10, whilst the phosphorus content was reduced by a factor of over 20 and reaching less than 73 ppm.

Properties of Silicon

Silicon is a crystalline semi-metal or metalloid. One of its forms is shiny, grey and very brittle (it will shatter when struck with a hammer). It is a group 14 element in the same periodic group as carbon, but chemically behaves distinctly from all of its group counterparts. Silicon shares the bonding versatility of carbon, with its four valence electrons, but is otherwise a relatively inert element.

Keywords: Silicon Extraction from Rice Husk Ash, Silicon from Rice, Investment Opportunities in Precipitated Silicon from Rice Husk Ash Project, Project on Silicon Extraction from Rice Husk Ash, Silicon from Rice Husk in India, Rice Husk ash fuel & Powder value added products, How to Earn Money from Rice Husk Ash, Processing Facility for Producting Silicon from Rice Husk Ash, Value Added Products From Rice Husk or Rice Hull Ash, Characterization of Rice Husk and the Process of Silicon From Rice Husk, Prod

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