

Effect of Temperature and Time on the Yield of Silica from Rice Husk Ash

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Abstract : The technological trend towards waste utilization and cost reduction in industrial processing has attracted use of Rice Husk as a value added material. Both rice husk (RH) and Rice Husk Ash (RHA) has been found suitable for wide range of domestic as well as industrial applications. Therefore, the purpose of this research is to produce high grade sodium silicate from rice husk ash by considering the effect of temperature and time of heating as the process variables. The experiment was performed by heating the rice husk at temperatures 500 °C, 600 °C, 700 °C and 800 °C and time 60min, 90min, 120min and 150min were used to obtain the ash. 1.0M of aqueous sodium hydroxide solution was used to dissolve the silicate from the ash, which contained crude sodium silicate. In addition, the ash was neutralized by adding 5M of HCL until the pH reached 3.5 to give silica gel. At 600C and 120mins, 94.23% silica was obtained from the RHA. At higher temperatures (700 °C and 800 °C) the percentage yield of silica reduced due to surface melting and carbon fixation in the lattice caused by presence of potassium. For this research, 600 °C is considered to be the optimum temperature for silica production from RHA. Silica produced from RHA can generate aggregate value and can be used in areas such as pulp and paper, plastic and rubber reinforcement industries.

Keywords : burning, rice husk, rice husk ash, silica, silica gel, temperature

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