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Production of furfural and active carbon by chemical treatment of Kai

Kiran Aftab[1], Aqdas Noreen[2]*and Muhammad Yousaf[1]

1. Department of Chemistry, Government College University, Faisalabad, **PAKISTAN**
2. Department of Applied Chemistry, Government College University, Faisalabad, **PAKISTAN**

Email: aqdas.gcuf@gmail.com

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ABSTRACT

In order to cope with the current situation and to cater the needs of our industry, it is imperative to exploit our own resources. For this purpose present research work was carried out to study the effect of chemical treatment on the production of furfural and active carbon from Kai (an agro-waste). Kai was impregnated with 14 % HCl and 14% H_2SO_4 for different digestion periods (100 and 140 minutes) by keeping the sample acid ratio of 1:5 and 1:1, using various salt catalysts ($NaCl$, $CaCl_2$, $ZnCl_2$, $AlCl_3$). Furfural was estimated colorimetrically. The adsorption capacity of active carbon prepared by the residue obtained after the recovery of furfural was evaluated by using iodine and methylene blue method. The results indicated that with increase in digestion time the furfural yield increases upto certain limit. In contrast to yield of active carbon the adsorption efficiency increases with increasing time period. In case of sample acid ratio greater yield of furfural was achieved with 1:5 ratio. While maximum yield of active carbon and its adsorption efficiency is attained with 1:10 ratio. The study proved that H_2SO_4 was better hydrolyzing agent for maximum yield of furfural and to increase the adsorption capacity of active carbon. The use of salt catalyst increases the adsorption capacity. Among the salts $ZnCl_2$ proved to be the best catalyst for furfural yield and for adsorption capacity of active carbon but average yield of active carbon was greater with $AlCl_3$.

Keywords: Chemical treatment, furfural, active carbon, hydrolyzing agents, adsorption efficiency.