

THERMAL AND STRUCTURAL PARAMETERS ANALYSIS OF CARBON PELLETS PREPARED FROM KOH TREATED PRE-CARBONIZED COTTON CELLULOSE

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ABSTRACT

Carbon pellets (CPs) precursor (cotton cellulose) was first pre-carbonized at low carbonization temperature, milled for 20 h and sieved to produce self-adhesive carbon grains (SACG). The SACG was treated with KOH having concentration from 0 to 0.07 Moles (*M*) and converted into green pellets (GPs) by applying 12 metric tones compression load on 2 g of samples in a mould with diameter of 2.72 cm. These GPs were carbonized up to the temperature of 500 °C-1000 °C, using a multi-steps heating profile. The CPs produced was washed by distilled water until reaching a pH of 6. The thermogravimetric data showed that with increasing KOH concentration, the weight loss of the samples at 600 °C markedly decreased, particularly at 0.07 *M* KOH concentration, and the maximum rate of weight loss for all the treated samples was higher and occurred at lower temperatures. The interlayer spacing (*d002*), stack height (*Lc*) and stack diameter (*La*,) of the turbostratic crystallites in the CPs estimated from Xray diffraction data showed that (a) for the CPs from the untreated GPs, *d002* increased with increasing carbonization temperature and linearly increased with $1/La$, (b) for the CPs (1000 °C) from the treated GPs, *d002* decreased with increasing KOH concentration but linearly increased with $1/La$. These findings indicate that the CPs have larger dimension of the turbostratic crystallites at higher temperatures, and such a dimension decreased for the GPs treated with higher KOH concentration.

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