

## TECHNICAL INDICATORS OF ACTIVE COAL OBTAINED BY CHEMICAL ACTIVATION OF THE CARBON RESIDUE OF RICE HAZEL PYROLYSIS

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Rice crop is one of the most important food products in the Republic of Myanmar [1]. Conversion of the rice crop to marketable grain is associated with formation of rice husk wastes these beneficial use is negligible due to their huge mass. Along with this, literature data [2–8] indicate the possibility of their processing into a number of marketable products, including, in particular, liquid glass, high-purity silicon dioxide, and activated carbons. The country needs for to solve the ensemble of environmental problems are very high, but the usage of those products is extremely limited by the high market value of these adsorbents and the lack of their own production.

In order to assess the feasibility of obtaining activated carbons from the said wastes, we carried out the recommended in the literature [9–11] reprocessing of the pyrolysis product of RH sample taken at one of Myanmar's enterprises. The pyrolysis conditions (heating rate of 10 ° C / min, final temperature of 600 ° C, the absence of isothermal aging) were adopted according to [12]. Some properties of the obtained carbonized material are presented in table. 1

Table 1

Adsorption-technical properties of Rice Husk carbonizate

| Indicator | Output,<br>% | V <sub>Σ</sub> ,<br>cm <sup>3</sup> /<br>g | Values Vs (cm <sup>3</sup> /g) by water<br>vapour |                  |                  | Adsorption,<br>mg/g |     |
|-----------|--------------|--|---|------------------|------------------|---------------------|-----|
|           |              |  | C <sub>6</sub> H <sub>6</sub>                     | CCl <sub>4</sub> | H <sub>2</sub> O | J                   | MΓ  |
| Value     | ~50          | 1,00                                       | 0,09  | 0,02             | 0,08             | 68                  | 160 |

Table. 1 indicate a adsorption capacity of the carbonizate, which according to [10, 11] can be significantly increased by removing silica from it and chemically activating the resulting carbon residue. For this, according to the procedure described in [11], a NaOH solution used to obtain, as a result, a white amorphous SiO<sub>2</sub> powder with a purity of 98% and a gravimetric density of 1.2 g / cm<sup>3</sup> with a silicon yield of 18%.

The carbonizate (K), washed from the remainder of the silicate solution and dried to constant weight, was impregnated in separate portions with ZnCl<sub>2</sub> solutions to ensure different ZnCl<sub>2</sub>: K ratios in the dried samples, which were then subjected to pyrolysis with a heating rate of 10 ° C / min to 650 ° C. Received activated carbons characterize the indicators presented in table. 2.

Table .2

Technical factors of active carbons of different degrees of impregnation

| Ratio ZnCl <sub>2</sub> :K | Output, % | V <sub>Σ</sub> , cm <sup>3</sup> /g | Values Vs (cm <sup>3</sup> /g) by water vapour |                  |                  | adsorption, mg/g |     |
|----------------------------|-----------|-------------------------------------|--|------------------|------------------|------------------|-----|
|                            |           |                                     | C <sub>6</sub> H <sub>6</sub>                  | CCl <sub>4</sub> | H <sub>2</sub> O | F                | MΓ  |
| 0,75:1                     | 25        | 1,00                                | 0,25   | 0,21             | 0,06             | 635              | 351 |
| 1:1                        | 25        | 1,02                                | 0,28   | 0,22             | 0,07             | 635              | 340 |
| 2:1                        | 21        | 1,00                                | 0,28   | 0,20             | 0,09             | 401              | 90  |
| 3:1                        | 21        | 1,02                                | 0,28   | 0,14             | 0,05             | 250              | 15  |

As can be seen from the table. 2, the optimal ratio is ZnCl<sub>2</sub>: K = 1: 1. In the table. Figure 3 shows the effect of the isothermal exposure time of such a material at 650 ° C on the same characteristics of activated carbon.

Table 3

Indicators of activated carbon depending on the duration of isothermal exposure after 650 ° C

| Duration, min | Output, % | V <sub>Σ</sub> , cm <sup>3</sup> /g | Value Vs (cm <sup>3</sup> /g) By water vapour |                  |                  | Adsorption, mg/g |     |
|---------------|-----------|-------------------------------------|---|------------------|------------------|------------------|-----|
|               |           |                                     | C <sub>6</sub> H <sub>6</sub>                 | CCl <sub>4</sub> | H <sub>2</sub> O | F                | MΓ  |
| 0             | 25        | 1,00                                | 0,25  | 0,21             | 0,06             | 635              | 352 |
| 30            | 26        | 1,01                                | 0,28  | 0,22             | 0,16             | 635              | 340 |
| 60            | 20        | 0,92                                | 0,14  | 0,09             | 0,22             | 698              | 45  |

|     |    |      |      |      |      |     |    |
|-----|----|------|------|------|------|-----|----|
| 180 | 18 | 0,74 | 0,15 | 0,11 | 0,14 | 635 | 22 |
|-----|----|------|------|------|------|-----|----|

Table. 3 show the inappropriateness of isothermal exposure in the studied process.

The resulting product has slightly lower values of the total porosity and absorption of iodine and methylene blue, but a larger sorbing pore volume compared to the carbon-mineral adsorbent based on PCh obtained in [13], although it is significantly inferior in quality to the active carbons described in [9, 10].

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