Study on the Reusing of the Pyrolysis Residues of Plastics in Waste Computer

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ABSTRACT

Abstract This study investigated the practicability for reusing the residues as an additive in tire from the pyrolysis of plastics in waste computer monitor. The properties of steam activated residues were determined to proide the useful data for other utilizations. This study include three parts: 1. Analyzing the physical properties of solid product residues from the pyrolysis of the plastic in waste computer monitor. 2.Analyzing the physical properties of steam activated residues. 3. Evaluating the practicality for reusing the residues from the pyrolysis of plastics in waste computer monitor. The percentages of solid products were 14.74% and 9.54% for the pyrolysis temperature of 375 and 425°C, respectively. The residues decreased with increasing pyrolysis temperature. For the elemental analysis, the percentages of C were above 80%. S and O were not observed in the residues.Comparing with commercialized carbon black, the specific surface area and porous from the pyrolysis of waste plastic were smaller than those of carbon black. Investigating the results of the elemental analysis, there was about 5% H in the residuses. It revealed that the hydrocarbons remained in the residues resulted in a small specific surface area and pore size. The residues obtained from the pyrolysis temperatures of 375 and 425°C were activated with steam. The results indicated that the average weight losses were 25.9-50.52% and 4.97-11.47%, respectively. One noted that the rate of weight loss decreasd with increased the activating temperature. This might be ascribed to the further reaction of hydrocarbon in the residues. After activating, the pore size of residues varied inversely with activating temperature. The pore size of residues after activating at 600°C was closed to that of commercialized carbon black (N330). Also, the specific surface area and the total pore volume increased with activating temperature. The specific surface area and the total pore volume obtained from steam activated residues were smaller carbon black. Finally, we discussed the effects of the ratios of additives on the properties of the tire sample. The result indicated that the physical properties of steam activated residues is better than those of residues without steam activation. For the hardness analysis, the effects of the addition of additives obtained at different activating temperatures on the hardness of tire was insignificant. Key Words : waste computer, pyrolysis, carbon black, tire.

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