

Ruttanaporn Eaknooch 2011: Development of Volatile Compound Absorption Sheets Forming by Wood Charcoal and Pulp. Master of Science (Environmental Technology and Management), Major Field: Environmental Technology and Management, Department of Environmental Science. Thesis Advisor: Assistant Professor Jukkrit Mahujchariyawong, Ph.D. 95 pages.

Wood charcoal is a good material for odor and moisture adsorption, but application of charcoal as adsorbent for toxic substrate is still limited. This research aims to develop absorbent sheet which made from powdered charcoal and pulp for various and easy implementations. Adsorption efficiency of indoor volatile compound was also investigated with combination of three types of powdered charcoal; mangrove, bamboo and eucalyptus and two types of pulp; mulberry pulp long fiber and eucalyptus pulp short fiber. Powdered charcoal was classified into two sizes, smaller than 53 micron and 53-300 micron, and used for adsorption efficiency investigation. The result showed that adsorption efficiency of mangrove and bamboo charcoal for ammonia and formaldehyde gas removals were higher than eucalyptus charcoal. Mangrove and bamboo charcoal have similar surface characteristics by SEM images as open pore, while eucalyptus charcoal has small and long pore. The adsorption efficiencies of mulberry and eucalyptus pulp for ammonia removal were 48.00 and 33.33%, formaldehyde removal were 44.00 and 16.67%, respectively. In the case of lab-scale adsorbent sheet, adsorption efficiencies of ammonia and formaldehyde removals were 99.33 and 88.00 % and efficiency of factory-scale adsorbent sheet showed 98.80 and 83.33%. Moreover, total volatile organic compounds from acrylic emulsion paint could be adsorbed 97.79 % by adsorbent sheet. The best absorbent sheet formed by charcoal size less than 53 micron and eucalyptus pulp, thickness of 90 grams, had adsorption capacity of ammonia and formaldehyde gas at 180.00 and 63.33 mg/g, respectively. This study showed the potential of modified adsorbent sheet for new product development that have ability to remove volatile compound, which harmful and annoying indoor air pollution.

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