Thesis Title THE STUDY ON THE PERFORMANCE OF SINGLE USE RESPIRATOR CONTAINING WITH COCONUT SHELL-ACTIVATED CARBON AGAINST BENZENE INHALATION

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ABSTRACT

Since benzene is a vapor which is hazard to health of workers in factories. It is widely used. The measurement and prevention for this hazard vapor is not properly. Most of safety devices are imported from the foreign countries, therefore its price is so expensive. The activated carbon made from coconut shell is the utilization natural resource and it is a good sorbent to adsorb the air pollution. It is low price and easy to apply. By these resons the research on the single use respirator containing with coconut shell-activated carbon are conducted.

The white cotton and paper tissue were cut into the 60 mm - diameter then sew it together as a rounded shape bag and

containing with activated carbon made from coconut shell which is 12+40 mesh in size and 9 gms in weight. The activated carbon is distributed all over the bag, the bag was then sew. It was tested for the performance, saturated time, and breathing resistance and compared to the commercial respirator which is widely common used for low organic vapor.

The result is the designed respirator has 94.81 percent of performance and breakthrough concentration is 1.0363 mg. Benzene adsorption is 18.9637 mg. The saturated time is 107.1 hours. The resistance to breathing; initial inhalation is 4.875 cm H_2O. The final inhalation is 4.9 cm H_2O. As for the commercial respirator-reference, its performance is 72.70 % . Breakthrough concentration is 27.20% , Benzene adsorption is 14.5593 mg. The saturated time is 23.1 hours. The initial inhalation is 2.45 cm H_2O and the final inhalation is 2.525 cm H_2O.

The resistance to breathing of both respirators are not significantly different.

Although, the designed respirator's performance is good enough to use but the other factors which are effect to its perfermance should be studied, such as various level concentration. Vapor detected with other devices should be improved, and if possible the dynamic system are recommended the contour of the respirator should be studied more.