# DEVELOPMENT OF $CO_2$ HARVESTER FROM THE PHOTOCATALYTIC DECOMPOSITION OF AGRICULTURAL WASTES

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# ABSTRACT

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Agricultural wastes are often found in different places where farming activities take place. These wastes are generated primarily by farming activities which is not limited during the production but also includes other activities related to farming and food chain. This agricultural wastes decomposed in a natural way and produced an amount of $CO_2$ which led directly into the atmosphere. Carbon dioxide is required by plants for photosynthesis and can be of great help to boost the growth when applied directly into plants. However, despite the abundance of it in the atmosphere, collecting and storing carbon dioxide is a major problem. Thus, this study aimed to develop a $CO_2$ harvester and storage system that can be used to harvest and store $CO_2$. The developed system is composed of a 1000L IBC tank with a UV light installed inside and a tire interior having a size of 20.8 × 38. The performance of the system showed that a 1000L IBC tank which contains a mixture of an agricultural waste such as rice straw, corn cob, chicken manure and titanium dioxide ($TiO_2$) for photocatalytic decomposition can produce a total volume of 42.2 L within 7 days. Moreover, it showed the comparison between the application of UV Light which applies for continuous exposure of sunlight during the night for 12 hours wherein it produces a total volume of 0.6 L and natural sunlight during the day wherein it produces a total volume of 41.6 L for another 12 hours. Among the two, daylight shows an excellent result in the production of $CO_2$ where it produces a larger volume of $CO_2$ than the application UV light or artificial sunlight during the night.

Keywords: agricultural waste; carbon dioxide; harvester & storage; titanium dioxide

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