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# Synthesis of Superabsorbent Polymer via Inverse Suspension Method: Effect of Carbon Filler

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**Abstract.** This paper studies on the effect of the addition of carbon filler towards the performance of superabsorbent polymer composite (SAPc). In this work, the SAPc was synthesized using inverse suspension polymerization method. The process involved two different solutions; dispersed phase which contains partially neutralized acrylic acid, acrylamide, APS and NN-Methylenebisacrylamide, and continuous phase which contains cyclohexane, span-80 and carbon filler (at different weight percent). The optimum SAPs and filler ratio was measured in terms of water retention in soil and characterized by Mastersizer, FTIR and SEM. Biodegradability of the polymer was determined by soil burial test and SAPc with 0.02% carbon has highest biodegradability rate. SAPc with 0.04wt% carbon showed the optimal water retention percentage among all the samples. The synthesized SAPc producing spherical shapes with parallel alignment due to the addition of carbon fiber. It can be concluded that the addition of carbon fiber able to enhance the performance of the SAP composite (SAPc).

## 1. Introduction

Superabsorbent polymers (SAP) are a type of three-dimensional matrix constituted by branched or linear hydrophilic polymers that are chemically or physically crosslinked which possess the ability to absorb large quantities of water or biological fluids [1,2]. The crosslinked structure of this polymer allows it to maintain a stable network even in its swollen state[2]. Acrylic monomers or polymers, polyacrylamide and other polyacrylates are the most widely chosen as the raw materials to form high performance superabsorbent materials[3-9]. SAP can also be associated with another class of compound or substances resulting in a composite superabsorbent polymers. In this study, superabsorbent polymer has been incorporated with fibril substance which is carbon fiber. Interaction between polymer matrix and carbon fiber may lead to the enhancement of the polymer properties. Recently, demand for biodegradable polymer material increase dramatically as people worldwide