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MECHANICAL AGITATION EFFECT ON SYNTHESIZE POLYSTYRENE NANOSPHERE PROPERTIES FOR AMMONIA DETECTION

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ABSTRACT- Mechanical agitation was performed to the synthesize polystyrene nanosphere (PSN) to evaluate the polystyrene properties before and after mechanical treatment. The aim of this study was to investigate the morphology and chemical properties of PSN and its effect on improving absorbance spectral for ammonia detection. The Bromo Cresol Purple (BCP) dye was incorporated into polystyrene for ammonia detection purpose. Mechanical treatment by sonication and centrifugation was found to bring about changes to surface chemistry of the polystyrene spheres, in particular the introduction of oxygen functionalities. The morphology and functional group identification was characterized using Scanning Electron Microscope (SEM) and Fourier Transform Infra-red (FTIR), respectively. All sample after mechanical treatment will be incorporated with BCP for ammonia detection and later on being tested by using UV-Vis to evaluate the absorbance spectral. As a result, SEM images showed that synthesized polystyrene particles were spherical in shape. The size of polystyrene particles was ranging between 40-60 nm and a slight growth of the particles size was observed after the encapsulation of dye which ranges 60-70 nm. Based on the UV-Vis result mechanical treatment by using sonification show a promising and improving in response time and sensitivity toward ammonia with 50% absorbance increase compare to untreated PSN. This suggested that treated PSN improved the sensitivity of the sensing material and it offer a promising material to overcome ammonia detection in water condition issue.

Keywords: polystyrene, nanosphere, polymerization.