

ABSTRACT

Recent years, research on aerosol filters especially air filters has attracted the attention of researchers in this field. So far, one of the effective methods for aerosol filtration is to use a nanofiber membrane as a filter produced by the electrospinning method and the electrospinning system is given a constant current to produce nanofibers that are similar in shape or uniform. The efficiency of this nanofiber filter can be measured its performance by filtering particles. Therefore, it is necessary to have suitable test particles for screening investigations. In air and water filtration applications, the commonly used test particle is polystyrene. Polystyrene is suitable for the test particles because it has a round and uniform shape that makes polystyrene particles applicable for calibration for aerosol measurements. Polystyrene is usually made by certain syntheses, namely the nucleation process and the spray-drying process. However, so far, the cost of synthesizing polystyrene is quite expensive. In this study, polystyrene particles were made using a simple polymerization method of nucleation. These polystyrene particles will be made in the order of micrometers by changing the concentration and time parameters. Polystyrene particles were prepared using 4 variations in the concentration of styrene monomer 6, 7, 8, and 9 wt%. The polystyrene particles with various concentrations produced a particle size of 481 to 805 nm. In the time variation experiment, polystyrene synthesis was carried out using 7 wt% styrene using different time variations 6, 7, and 8 hours. The polystyrene particles resulting from this time variation have sizes ranging from 634 to 679 nm. The size of the polystyrene particles can be influenced by 3 variables, namely the monomer concentration of styrene, temperature and initiator. Synthesis time variable has insignificant effect on the particle size of polystyrene, but it affects the nucleation process so limited time can produce polystyrene which is not completely synthesized.

Keywords: *Polystyrene, Ultrapure Water, Zeta Potential, HCL, K₂S₂O₈.*