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Nanoclay application to geotextiles to improve adsorption function for removal of heavy metal and toxic components in waste landfill sites

Nanofibers are one of the most advanced materials which can be easily designed with high performance materials having distinctive properties. In addition to fibers, nanoparticles (such as nanoclay) can be used to make unique formulations which can, in turn, be used to make conventional fibers for geotextiles and yarn-type geogrids. As an example of nanocomposite geo-synthetics in geo-environmental applications, it is very important to eliminate the toxic and organic components of various waste leachate solutions. There is no such capability for the standard manufactured nonwoven geotextiles and needed is to manufacture the functional nonwoven geotextiles which can absorb the toxic and organic components that may be harmful to personal health and the environment. The general concept of nanotechnology formulations used to manufacture geotextiles is introduced in this paper. Separation and filtration functions using geotextiles from nanoclay formulations are introduced as an important concept. For an example of nanoclay formulations used to manufacture geotextiles, yellow clay as nanoparticles were added to make a polyester formulation in turn to make nonwoven geotextiles to improve the removal effects of toxic and organic components of leachate solutions. Engineering test behavior was evaluated to confirm the effects of yellow clay addition. Finally, the possibility of nanocomposite formulations for geo-synthetics is considered in a number of common situations.

Biography

Han-Yong Jeon is a Geosynthetics/Technical Organic Materials Researcher and he was the 32nd President of Korean Fiber Society (2014~2015). He has published more than 881 proceedings in domestic and international conferences. He wrote 20 texts including 'Geosynthetics' and also published 144 papers in domestic and international journals. He has won the awards of Marquis Who's Who-Science and Engineering in 2003~2018 and also, he got the 33rd Academy Award of Korean Fiber Society in 2006 and "Excellent Paper Award of 2012" by The Korean Federation of Science and Technology Societies.

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