Ashoke Karmokar, Expert Opin Environ Biol 2016, 5:3(Suppl)
http://dx.doi.org/10.4172/2325-9655.C1.011

Scraptires: Diversified technology portfolio for the application of recycled rubber materials

Ashoke Karmokar
Bridgestone Corporation, Japan

Scrap tires constitute a large volume of solid waste in many countries. As per the scrap tires management scenario available in many parts of the world, the share of material recycling sectors are very limited though a high percentage of scrap tires generated is being recycled. With the aim of increasing the share of scrap tires in material recycling sector, attempt has been made to explore the use of scrap tire derived materials as geomaterials in civil and/or geotechnical engineering applications. The present paper deals with the research studies on developing cement treated clay-rubber geomaterials, including a corresponding field trial undertaken in Japan. Laboratory studies have shown that the mixing of scrap tires derived granulated rubber offers an effective means of improving toughness (ductility) of cement treated clay while maintaining the very low permeability characteristics. X-ray CT scan on cement treated clay rubber specimens under unconfined compression condition has shown that cracks only appear around the rubber grain after reaching peak stress. This may be attributed to the fact of differences in Poisson's ratios of rubber grain and cement treated clay. Minute cracks those developed successively around the rubber grain have prevented the growth of wide cracks as opposed to the cement treated clay, and thus enabling their use in structures where deformation is anticipated. In line with our findings, a field trial on the barrier wall design of a sea-bed disposal site at Tokyo bay, Japan has been conducted. An important aspect laid for the design was to minimize barrier foundation breakage in the case of serious deformation of the revetment. Cement treated clay-rubber was applied at the barrier wall foundation of the sea-bed disposal site upon mixing dredged clay retrieved from the sea-bed of the construction site, cement and scrap tire derived rubber grains. About 80 tons of rubber grains with a size range of 1-3 mm were used in this case study.

Biography

Ashoke Karmokar is currently a Fellow (Manager) in the Innovation Division of Birdestone Corporation. He completed BSc (Tech) graduation degree from Calcutta University in 1985 and MTech post-graduation degree from Bombay University in 1988. He joined Indian Institute of Technology (IIT) Delhi as Research Scholar and spent about 3 years before shifting to Japan for higher studies in 1991. He received Dr.Eng. degree from the Faculty of Technology of Tokyo University of Agriculture & Technology, Japan in 1996 and then served as Assistant Professor in the same university for over 3 years. He joined Technical Center of Bridgestone Corporation, Japan in 1999 for research and development of various environmentally friendly technologies. He got promoted to Fellow (Manager) position in 2009 and worked all along in the Central Research Division before moving to Innovation Division in 2015. Among others, he published several technical papers and received environmental award from the academic society.

ashoke.karmokar@bridgestone.com

Notes: