

Recycling and Waste Management

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Recycling waste plastics for road construction as an aggregate modifier - Innovation for sustainable development in developing economies

Trinity Ama Tagbor 1, Troutman H2, Appiah J K3 and Adjei D1

1 Council for Scientific and Industrial Research- Building and Road Research Institute, Ghana

2 EAP Consult Ltd, Ghana

3 Latex Foam Rubber Products Ltd, Ghana

In many developing countries, including Ghana, disposal of plastic waste through conventional methods of landfilling, incineration and communal dumps are not able to effectively deal with the increasing volumes of wastes generated daily. Wide-spread occurrence of haphazard littering results in heavily polluted beaches, rivers, gutters and roadsides with detrimental impact on human health, ecosystems, critical urban infrastructure and therefore on productivity and the economy. Conventional bitumen used as a binder in asphalt roads does not meet increasing material performance requirements resulting from rapid increases in vehicular traffic intensity and the deteriorating effects of climate change (CC), particularly in hot and humid tropical climates. Polymers are added to conventional bitumen mixes to increase the stability and durability of roads and to reduce the cost of construction and maintenance over the lifetime. This paper is one part of a broader study exploring alternative uses for waste plastics in the construction industry as a potential sink for sustainable management of waste plastics and also for performance enhancement and cost reduction in the construction sector to support a myriad


of development needs of rapidly-developing economies.

This paper reviews literature on polymer modified bitumen (PMB) with focus on waste plastic modified aggregates (PCA). In this study, the history and benefits of using waste PCA in asphalt are outlined followed by a review of some studies on using PCA in asphalt and a discussion of its possible application as a sustainable material for flexible road construction in a developing economy such as Ghana.

Speaker Biography

Trinity Ama Tagbor is specialized in Natural Product Chemistry. She has many years of experience in research, development and advisory services in construction materials from local sources. Her research areas include innovative construction materials from local sources, Polymer modified construction materials including waste plastic/bitumen composite materials for construction of roads and buildings for sustainability, emulsion and insecticidal emulsion paints from local materials. Her current research is on incorporation of waste materials into construction for cost effectiveness and sustainable management of waste plastic. She is currently a member of committee which is planning to organize a conference on 'Building Climate resilience of Infrastructure in Ghana' which is scheduled to take place in Ghana in 2019.

e: amitagbor@yahoo.co.uk

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