

Microwave assisted method for the decomposition of asbestos-cement composites

A.M.P.L. Adikari¹, K.A.P.R. Kaluarachchi¹, N. Gunawardhana^{2*}

¹Postgraduate Institute of Science, University of Peradeniya, Sri Lanka, International Research Centre, University of Peradeniya, Sri Lanka

**nandagunawardhana@pdn.ac.lk*

The rapid development in the areas of construction in Sri Lanka led to the wide use of asbestos related products. Though asbestos is not still banned in Sri Lanka it is nominated to be banned in 2018. Therefore proper elimination of asbestos containing materials after the usage is essential. Hence the development of environmental friendly, low cost and a simple method is very important to destruct the fibrous structure of asbestos.

In this study, Microwave radiation was used as an alternative energy source for traditional heat treatment methods. Its benefits include time savings, increased process yield and environment compatibility.

Initially the samples were studied after the conventional heat treatment, appropriate for the decomposition of fibrous structure of asbestos using SEM, IR and XRD methods. SEM images clearly show the transformation of asbestos fibrous form in to a powdered material after the decomposition. IR spectrum clearly shows the disappearance of the characteristic double peak at 3640-3680 cm⁻¹ for asbestos fibrous structure. The disappearance of the characteristic peaks at 12° and 25° (2θ) in the XRD data confirms the damage of the fibrous structure.

Decomposition was observed SEM, IR and XRD for the samples treated thermally using microwave as an alternative energy source other than the conventional heat treatment methods. According to the structural and phase transformation of selected samples, microwave radiation can be recommend as an alternative energy source for traditional heat treatment methods use in the decomposition of asbestos. Further details will be discussed in this presentation.