

SUITABILITY OF THE POLAR EXTRACTION OF *Moringa oleifera* (MURUNGA) LEAVES AS A NATURAL ANTIOXIDANT FOR DRY RUBBER COMPOSITES

Chathushani M.K.C.L.¹, Sampath W.M.G.^{1*} and Weththasinha H.A.B.M.D.²

¹Department of Technology, Rubber Research Institute, Sri Lanka

²Department of Physical Sciences and Technology, Faculty of Applied Sciences, Sabaragamuwa University of Sri Lanka, Sri Lanka

*wikcramage@yahoo.com

Antioxidants (AOs) are added to minimize or remove the degradation ability of rubber in rubber compounding. Due to the drawbacks of currently available commercial AOs, the replacement of a natural AO with dry rubber composites gained attention. In this study *Moringa oleifera* leaves methanol extraction and its modified version with ascorbic acid was applied as AO for dry rubber and its physio-mechanical properties, chemical properties, thermal properties, ultra violet resistivity and morphological behaviour were compared with commercially available AOs, such as N-isopropyl - N'-phenyl-p-phenylenediamine (IPPD), 2,2,4-trimethyl-1,2-dihydroquinoline polymer (TMQ), and 2-2'-methylenebis(6-(1-methylcyclohexyl)-P-cresol (WSP). Dry rubber composite without any AO is considered as the reference composite. Evaluation of the ageing properties of the dry rubber composites of modified version and natural AO used one showed that the highest retention of the tensile strength with respect to natural AO and modified version. By comparing 2, 2-diphenyl-1-picrylhydrazyl (DPPH) scavenging ability of the most popular commercially available AO of IPPD, polar extraction of *Moringa oleifera* leaves and its modified version, lowest value of DPPH scavenging ability was shown by the IPPD. Based on the results of above-mentioned characterizations, we can conclude that the polar extraction of *Moringa oleifera* leaves and its modified version has superior AO properties than the commercially available AOs for the dry rubber composites.

Keywords: Rubber compounding, Antioxidants, Degradation, Rubber composites, Ageing properties