

TITLE	THE USE OF MODIFIED PALM OIL AS PROCESSING AIDS IN TIRE TREAD APPLICATIONS
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ABSTRACT	<p>Rubber process oils (RPOs) are generally incorporated to rubber compounds for improving processability and also state-of-mix in some circumstances. Distillate aromatic extracts (DAE) classified as petroleum-based oils contain high content of aromaticity, and are therefore, widely used as effective RPO especially for a styrene-butadiene rubber (SBR) in tire tread application. Unfortunately, the DAE is designated as a carcinogenic substance due to the presence of polycyclic aromatic hydrocarbons (PAHs). Consequently, many non-carcinogenic alternatives including treated distillate aromatic extract (TDAE) and mild extraction solvate (MES) have been developed to replace the DAE. Nonetheless, both TDAE and MES are still petroleum-based products with limited reserve. Therefore, RPOs produced from renewable natural oils including palm oil have gained interest recently. The present work focused on a preparation of modified palm oil (MPO) via a transesterification reaction with benzyl alcohol. The success of modification was evidenced by FT-IR and ¹H-NMR results. Thereafter, the MPO prepared was then used as an alternative to petroleum-based DAE, and its performance as RPO was compared with commercially available DAE. Furthermore, the MPO was blended with (T)DAE at various blend ratios. Styrene-butadiene rubber/ butadiene rubber (SBR/BR) blends incorporated with MPO as RPO exhibit comparable or superior processability and cure properties to those with DAE. In addition, the use of MPO demonstrates the vulcanizates having greater abrasion resistance with lower heat build-up than the use of DAE. In other words, MPO prepared in this work is effective to be used as RPO in SBR/BR blends for rubber tire tread applications.</p>