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Sustainability and environment

**Laboratory Study of Relative Leachability of Chromated Copper Arsenate
Preservative from Treated Woods among Soil Types of Sarawak**

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ABSTRACT

Wood and soils are important natural resources from the environment and serves mankind well respectively as structural materials and natural platform erecting such materials. With shortfalls of naturally durable timber species for protected in-ground uses under Malaysian environments, Chromated Copper Arsenate (CCA) treated woods are widely used instead, incurring serious potential threats of preservative leaching from wood to the surrounding soil environment. This paper highlights a laboratory study into the relationship of the physical and chemical properties of main soil types of Sarawak, Malaysia, i.e. red-yellow podzolic, grey-white podzolic, gley, podzols and peat soil, on CCA leaching resistance or susceptibility from three treated wood species rubberwood sapwood (*Hevea brasiliensis*), engkabang undifferentiated wood (*Shorea macrophylla*) and mangium heartwood (*Acacia mangium*) materials in shallow soil-burial according to the AWWPA E20-04 laboratory test methodology. Statistically significant ($P < 0.05$) variations were detected between wood species as well as leaching of CCA and its component heavy metals. Engkabang wood yielded the highest overall mean CCA losses [620 ppm (44.0 %)] while *A. mangium* heartwood had the least mean CCA metal losses [374 ppm (26.0 %)] among the treated woods. Arsenic showed the highest deposition [757 ppm (53.0 %)] compared with chromium [370 ppm (26.0 %)] and copper [295 ppm (21.0 %)] among different soils. Overall, leaching of Cu, Cr and As was higher in more acidic soils, while soil macronutrient (N, P, Ca and Mg), micronutrient (Zn, Mn) levels, pH, cation exchange capacity, organic matter content and soil microbial count have significant ($P < 0.05$) negative correlations to leaching losses of one or all of Cu, Cr and As.

Keywords: treated wood, CCA leaching, AWWPA leaching test, tropical soils, soil properties