Acoustic Behavior of Polymer Foam Composite of Shorea leprosula after UV-Irradiation Exposure

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Abstract : This study was developed to compare the behavior and the ability of polymer foam composites towards sound absorption test of Shorea leprosula wood (SL) of acid hydrolysis treatment with particle size < 355µm. Three different weight ratio of polyol to wood particle has been selected which are 10wt%, 15wt%, and 20wt%. The acid hydrolysis treatment is to optimize the surface interaction of a wood particle with polymer foam matrix. In addition, the acoustic characteristic of sound absorption coefficient (I) was determined. Further treatment is to expose the polymer composite in UV irradiation by using UV-Weatherometer. Polymer foam composite of untreated shorea leprosula particle (SL-B) with respective percentage loading shows uniform pore structure as compared with treated wood particle (SL-A). As the filler percentage loading in polymer foam increases, the I value approaching 1 for both samples. Furthermore, SL-A shows better I value at 3500-4500 frequency absorption level(Hz), meanwhile I value for SL-B is maximum at 4000-5000 Hz. The frequencies absorption level for both SL-B and SL-A after UV exposure was increased with the increasing of exposure time from 0-1000 hours. It is, therefore, concluded that the I for each sound absorbing material, with or without acid hydrolysis treatment of wood particles and it's percentages loading in polymer matrix effect the sound absorption behavior.

Keywords : polymer foam composite, sound absorption coefficient, UV-irradiation, wood

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