

عنوان مقاله:

Effect of surface treatments on damping behavior of carbon and glass fiber reinforced friction material

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خلاصه مقاله:

The ability to absorb vibrations in a vehicle during braking conditions depends primarily on the selection of ingredients for a friction material and interfacial adhesion between all these ingredients. In this work, a hybrid brake friction material is developed by combination of carbon fiber (CF), glass fiber (GF), resin and other ingredients. The surfaces of carbon and glass fibers are chemically inert and hydrophobic in nature. Therefore, CF and GF surfaces are modified with surface treatments to increase hydroxyl or carboxyl groups on the surface. An attempt is made to improve the bonding strength between CF, GF, ingredients and polymer matrix. CF surface is modified by oxidation, HNO₃ treatment and grafting multi walled carbon nano tubes functionalized (MWCNT-F) on CF. GF surface is modified by HNO₃ treatment. Carbon fiber and glass fiber content after surface modifications is mixed with all the ingredients and resin. Friction composite sheets are fabricated by using hand layup method. The resulting materials are characterized by SEM, TGA and FTIR analysis. MWCNTs-F on CF surface is observed. Sample specimens are cut from the friction composite sheets and damping behaviour of the specimens is evaluated by using FFT analyzer. The best surface treatment method and ingredients are selected to fabricate a friction material to reduce squeal generation at the interface between brake disc and pad.

کلمات کلیدی:

Multi walled carbon nano tubes, carbon fibers, glass fibers, chemical grafting, damping, and Interfacial shear strength

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