

# Variability and performance study of the sound absorption of used cigarette butts

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There has been increasing interest in new sustainable materials that can be used as construction materials. Among them, sound-absorbing materials have an important role in both acoustical room conditioning and in room insulation. As a proposal for recycling, one of the most common residues in the world, cigarette butts, is studied. Samples were prepared with used cigarette butts as acoustical absorbent materials. Several samples were prepared and grouped by similarity. Variability analyses of the samples prepared in each group were performed. Moreover, the analysis of some possible influences on absorption properties, such as the length of butts, presence of burnt regions, presence of wrapping paper, etc., were analyzed. The results show the potentiality of this residue to be used as an acoustical absorbent since the absorption coefficients found are greater than 0.8 for frequencies over 2000 Hz. The observed variability in the study group and samples can be considered low, as it was below 2% for the major part of frequencies. Influences on the absorption coefficient, for both the length and status of the butts, were statistically confirmed. © 2019 by the authors.

Cigarette butts

Recycling

Sound absorber

Sustainable material

Variability analysis

Absorption

Adsorbents

Recycling

Sound insulating materials

Sound insulation

Tobacco

Absorbent materials

Absorption co-efficient

Absorption property

Cigarette butts

Sound absorber

Sound absorbing materials

Sustainable materials

Variability analysis

Acoustic wave absorption

Absorption

Acoustic Insulation

Adsorbents

Construction Materials

Length

Recycling

Samples

Tobacco