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Acta Medica Iranica

2009;47(4) : 1-10

original

Manufacturing sound absorber based on combined recycling of polyethylene terephthalat and polystyrene at low and median frequencies

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Received: March 2,2008

Accept : June 28,2008

Available online: December 21,2008

Abstract:

Background and aim: Noise pollution is one of the main cause of occupational hearing loss. According to WHO reports in many countries workers have been exposed to 85 - 90 dB noise level. The purpose of this study is to manufacture a sound absorber based on combined recycled polyethylene terephthalat (PET) and polystyrene (PS) with an economical method in order to control of noise pollution

Materials and methods: Sound absorber was made of PET and PS with equal weight percent, polyester fiber, and polyvinyl acetate resin, with five to ten centimeters thick. Sound mean absorption coefficient percents were determined by acoustic impedance tube and compared with those of rock wool.

Results: Mean absorption coefficient percent of samples with one to five millimeter pore size and ten centimeters thickness was significantly better than those with six to twenty millimeters pore size in 50 to 630, 1250, and 1600 Hz, ($p < 0.05$). In general, samples mean absorption coefficient was significantly different from those rock wool ($p = 0.005$).

Conclusion: Recycle polymere absorbers may play an important role in national economics as they are prophylactic to some occupational disease and also are economical.

Keywords:

plastic recycling , polyetylen terephthalat (PET) , polyetylen (PE) , combined recycling , low frequency , sound absorber

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