



PRODUCTION AND CHARACTERIZATION OF ECONOMICAL HYBRID POLYMER MATRIX COMPOSITES

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The aim of this study was to development of economic hybrid composites which have enhanced mechanical properties with the addition of ceramic and glass fiber wastes into epoxy resin. Waste inventory of ceramic factories involves fired vitrified product waste amounts to 400 tons/month and floor tile product waste amounts to 4000 tons/month. This waste quantity is quite high and it should be reevaluated. The utilization of wastes will be realized with the addition of grinded ceramic wastes into the polymer matrix as a reinforcement phase. This process not only reduces the production cost but also reduces environmental pollution. Ceramic and glass fiber wastes were grinded and particulated in the required size ranges. The characterization of waste particulate fillers was carried out by scanning electron microscopy(SEM), X-ray diffraction(XRD), X-ray fluoeresans, laser diffraction and He gas picnometer techniques. The effects of the ceramic:glass fiber ratio and the particle size on the physical and mechanical properties were determined with a fixed polymer:filler ratio of 40:60. The density, three point bending strength, impact resistance and hardness of the hybrid composites were measured. The results indicated that the bulk density remained unchanged, and the bending strength and impact resistance decreased, while the hardness and elastic modulus were almost constant with increasing filler particle size. Moreover, because of the weak matrix-reinforcement interface, mechanical properties was deteriorated with the increasing amount of waste glassfiber. Additionally, due to the high surface area and stronger matrix-reinforcement interface bonding of fine particles, better mechanical properties were achieved. As a result, incorporation of waste ceramic and glass fiber basically resulted in the reinforcement of the epoxy matrix. This allows recycling of the residues as well as improves some mechanical properties of the composites.

Keywords: ceramic waste, epoxy matrix, glass waste, hybrid composite, mechanical properties

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	<p>Mustafa TÜFEKÇİOĞLU (<i>Artvin Çoruh University, Artvin, Turkey</i>)</p> <p>Stream Bank Soil Losses within the Watershed Scale</p>
	<p>OP183 Hacı Bektaş-ı Veli Hall (2nd floor)</p> <p>Emine Esra GEREK (<i>Anadolu University, Eskişehir, Turkey</i>), Seval Yılmaz, Filiz B. Karel, A. Savaş Koparal</p> <p>Esin APAYDIN VAROL (<i>Anadolu University, Eskişehir, Turkey</i>), Murat Kılıç, Elif Saraçoğlu, Başak Burcu Uzun</p> <p>Catalytic Upgrading of Fast Pyrolysis Biomass Vapors over Cobalt Promoted ZSM-5 Catalyst</p>
14:15-14:30	<p>OP185 Cengiz Aytmatov Hall (Entrance floor)</p> <p>Mehmet BERKÜN (<i>Istanbul Kültür University, Istanbul, Turkey</i>), Ümmükülsüm Özel Akdemir</p> <p>Environmental Impacts of Desalination Plant Intakes and Discharges and Hydraulic Planning</p>
	<p>OP186 Hoca Ahmed Yesevi Hall (1st floor)</p> <p>Nilay AKÇAY (<i>Recep Tayyip Erdoğan University, Rize, Turkey</i>), Özgür Zeydan, Murat Karayılan, Ülkü Alver Şahin, Fatih Alver, Burcu Onat</p> <p>Modeling of PM₁₀ Dispersion in Rize City Center</p>
	<p>OP187 Yunus Emre Hall (1st floor)</p> <p>Nurcan ÇALIŞ AÇIKBAŞ (<i>Bilecik Şeyh Edebali University, Bilecik, Turkey</i>), Gokhan Acikbas</p> <p>Production and Characterization of Economical Hybrid Polymer Matrix Composites</p>
	<p>OP188 Hacı Bektaş-ı Veli Hall (2nd floor)</p> <p>Necla ÇAĞLARIRMAK (<i>Celal Bayar University, Manisa, Turkey</i>), Fatih B. Gurarslan</p> <p>Renewable Energy Systems, Environment Effects, an Estimated Design of Wind</p>



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