

# JOINT E-CONFERENCE ON RENEWABLE ENERGY AND SUSTAINABILITY & GEO SCIENCE AND GREEN TECHNOLOGY MARCH 15-16, 2023 | WEBINAR



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### **Polypropylene-chitosan sponges prepared via thermal induce phase separation used as sorbents for oil spills cleanup**

Creating inexpensive, highly efficient, and recyclable sponges for water remediation is significant but remains a big challenge. Herein, we report a facile method to fabricate cost-effective, environmentally friendly, and reusable sponges by blending Polypropylene with renewable resources (chitosan) with different ratios via thermal induce phase separation (TIPS). The properties of obtained sponge have been deeply evaluated in terms of the thermogravimetric analyzer (TGA), Fourier transforms infrared measurement (FTIR), and scanning electron microscopy (SEM). Besides, wettability properties of (engine oil -soybean oil) were analyzed. Newly sponges showed better thermal properties than Polypropylene with increased chitosan of more than 20%wt. Chemical characterization confirmed the successfully blending between components. Additionally, the wettability properties were influenced by increasing chitosan loading, where the water contact angle increased more than 130° due to increased surface roughness. These results revealed that new sponges are an ideal alternative sorbent for oil spill cleanup. The sorption was increased with an increased chitosan loading, where spongePP40CH registered the highest sorption, more than 700%, with oil retention of more than 80%. The obtained sponge could be used as a promising filter screen for separating oils and organic liquid from contaminated water with more than 90% separation efficiency. Thermal induce phase separation is an easy, eco-friendly, cost-effective, and practical way to produce a blend sponges with great potential usage prospects in purification and oil spill cleanup and make new sponges more competitive and promising candidates than commercial absorbents.