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| **Published Researches****الأبحاث المنشورة** |
| Title**عنوان البحث** | [Fabrication of polypropylene/lignin blend sponges via thermally induced phase separation for the removal of oil from contaminated water](https://link.springer.com/article/10.1007/s42452-020-03372-z) |
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| Abstract**خلاصة** | Polypropylene is widely used in oil spillage cleanup due to excellent characteristics. However, polypropylene is not renewable and biodegradable, which is unacceptable to introduce new pollutants while solving environmental disasters. Therefore, there is a high demand to explore a low-cost, environmentally friendly, and renewable technique for the fabrication of porous materials. In this work, lignin was chosen as the second blend in the polymer matrix. Polypropylene and renewable lignin sponges were successfully prepared using simple, inexpensive, controllable, scalable, and an environment-friendly method named thermally induced phase separation (TIPS). The surface morphology of obtained sponges was investigated using FTIR and SEM. FTIR analysis indicated that PP and lignin were physically blended. SEM analysis observed an interconnected porous network that acts as a capture site of oil, and lignin merged into PP. The contact angle of PP, PP5L, PP10L, PP15L, and PP20L was found to be 127.4°, 118.71°, 113.89°, 109.45°, and 107°, respectively. Furthermore, polypropylene/lignin sponges have good adsorption ability toward oils compared to polypropylene itself. The research detected that the highest oil sorption tests exhibited by PP10L sponge, which could absorb 983% of soybean oil, 788% of engine oil, and 550% of lubricating oil in the oil system, with high oil retention more than 90% after 24-h dripping. Besides, the results revealed that temperature has a significant effect on oil absorption. All of these features make polypropylene/lignin blend sponges promising sorbents for the oil spills cleanup, not only for oil recovery but also helps in cleaning the environment. |