

## Impregnation of liquid natural rubber (LNR) foam with activated carbon for enhancing oil removal from water

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### ABSTRACT

Macroporous rubber foam made of liquid natural rubber (LNR) was fabricated at ambient temperature by using sodium bicarbonate ( $\text{NaHCO}_3$ ) as foaming agent and  $\text{S}_2\text{Cl}_2$  as crosslinker. Activated carbon was added through blending process to enhance oil sorption performance. The scanning electron microscopy morphology analysis showed that the LNR-foam has produced pores with diameter sizes between 50 and 150  $\mu\text{m}$  whilst porosity volume was in range of 5.5–6.5 mol/cm<sup>3</sup>. The swelling properties of this porous LNR-foam incorporated with activated carbon and their application as various oil types (petrol A, petrol B, diesel, olive, kerosene and engine oil) were evaluated. Result showed that absorption capacity was totally depending on the viscosity of oil. At optimum crosslinker concentration (6.5 w/w %), petrol A has been absorbed up to 5.47 g g<sup>-1</sup> while olive oil approximately 1.00 g g<sup>-1</sup>. The LNR-foams are able to be re-used up to 20 absorption cycles which indicates them as good reusability material. Therefore, this natural based foam is highly potential to be used as alternative absorbent that are readily available.

**Keywords:** Macroporous; Foam; Activated carbon; Rubber; Oil spill

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