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# An environmentally friendly method for the fabrication of reduced graphene oxide foam with a super oil absorption capacity

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## Abstract

Three kinds of graphene oxide (GO) foams were fabricated using different freezing methods (unidirectional freezing drying (UDF), non-directional freezing drying, and air freezing drying), and the corresponding reduced graphene oxide (RGO) foams were prepared by their thermal reduction of those GO foams. These RGO foams were characterized by Fourier transform infrared spectroscopy, thermal gravimetric analysis, X-ray diffraction, X-ray photoelectron spectroscopy, and scanning electron microscopy. The absorption process and the factors that influence the absorption capacity were investigated. The RGO foams are hydrophobic and showed extremely high absorbing abilities for organic liquids. The absorption capacity of the RGO foams made by UDF was higher than 100g g<sup>-1</sup> for all the oils tested (gasoline, diesel oil, pump oil, lubricating oil and olive oil) and had the highest value of about 122 g g<sup>-1</sup> for olive oil. The oil absorption capacity of the GO foams

was lower than that of the RGO foams, but for olive oil, the absorption capacity was

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