

## Facile nitrogen doping using alkylamine on reduced graphene hydrogel for improved adsorption of wastewater pollutants

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## Abstract

Nitrogen-doped graphene has garnered ample of attention for their application in wastewater treatment. As depicted in Fig. 1, alkylamine functionalized on reduced graphene hydrogel (rGH) was achieved via a facile two-steps method involving the hydrothermal treatment of graphene oxide (GO) to rGH and the dialysis treatment of the rGH in solution containing octylamine (OA), decylamine (DA) and dodecylamine (DDA). Alkylamine functionalization promotes covalent integration through chemical reactions between the amine and remaining epoxy groups of the graphene hydrogels which provides strong interfacial interaction with any material of interest. The purpose of this study is to evaluate the impact of various alkylamine chain length functionalization on rGH. We posit that the dialysis treatment removes water content in the hydrogels and was replaced with the amine content dissolved in EtOH due to osmotic pressure. Herein, we report the successful grating of the various alkylamine chain length on rGH surface which was confirmed with spectroscopic and imaging techniques including FTIR, XRD, XPS, SEM, EDX elemental mapping and TGA. To evaluate the adsorption capability of the hydrogels, adsorption kinetics on methylene blue (MB) and bisphenol-A (BPA) were conducted and fitted by a pseudo-second-order kinetic model. This proposed grafting route will open interesting possibilities in the design of graphene-based materials with improved adsorption performance.



## Biography

Alvin is currently a second-year doctoral student in the graduate school of life science and systems engineering, kyushu institute of technology, Japan under the supervision of associate professor Dr. Yoshito Andou. His research interest is on the remediation of wastewater using graphene-based materials.



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