

## عنوان مقاله:

Synthesis of some silyl derivatives of graphene oxide

## محل انتشار:

بیست و هفتمین کنفرانس شیمی آلی ایران (سال: 1398)

تعداد صفحات اصل مقاله: 1

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## خلاصه مقاله:

Graphene is 2-D structure of a single-atom-thick sheet of sp<sup>2</sup>-hybridized carbon atoms arrayed in a honeycomb pattern.<sup>1</sup> One specific branch of graphene research deals with graphene oxide (GO). Graphene oxide consists of a single-layer of graphite oxide and is usually produced by the chemical treatment of graphite through oxidation, with subsequent dispersion and exfoliation in water or suitable organic solvents. There are various oxygen containing functional groups in the GO. The oxygen functional groups have been identified as mostly in the form of hydroxyl and epoxy groups on the basal plane, with smaller amounts of carboxy, carbonyl at the sheet edges.<sup>2</sup> In this study Graphene oxide (GO) was prepared by a modified Hummers method (KMnO<sub>4</sub>, NaNO<sub>3</sub>, H<sub>2</sub>SO<sub>4</sub>) from natural graphite powder.<sup>3</sup> The structure of GO was characterized by X-ray diffraction (XRD), and Fourier transform infrared (FT-IR) spectroscopy. Then Graphene oxide (GO) was successfully silylated by various alkylchlorosilanes in the presence of Triethylamine (base) and Tetrahydrofuran (THF) as a solvent. The following reagents were used for silylation of GO, trimethylchlorosilane, triethylchlorosilane, Tert-Butyl dimethylchlorosilane, and Vinyl dimethylchlorosilane. The products were analyzed by X-ray diffractometry, FT-IR and TG measurements. Energy dispersive X-ray spectroscopy (EDX) was determine the silica composition in the samples. The results show that thermal stability and lipophilicity of silylated Graphene oxide were increased. This stability of silylated GO indicates that Si is strongly bonded to the GO layers via Si-O covalent bonding.

## کلمات کلیدی:

Graphene, Graphene oxide, Silylation, Silyl ether, Vinylsilane

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