

### IIk32-004

#### **Low-temperature reduction of graphene oxide using the HDDR process for electrochemical supercapacitor applications**

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In the present work, attempts of reducing a graphene oxide powder using a low temperature hydrogenation disproportionation desorption and recombination process (L-HDDR) has been carried out. A lower processing temperature in large scale production is significant as far as costs are concerned. Graphite oxide was prepared using a modified Hummers' method and dispersed in ethanol, exfoliated using ultrasonication to produce Graphene Oxide (GO). Investigations have been carried out by X-ray diffraction (XRD) and scanning electron microscopy (SEM). The experimental results of L-HDDR processing graphene oxide powder using unmixed hydrogen at 400°C and relatively low pressures (<2 bars) have been reported. X-ray diffraction patterns showed a reduction of graphene oxide with the L-HDDR process. The results showed that the L-HDDR process, as the standard HDDR process, can be applied to the reduction of graphene oxide to produce supercapacitor materials. The advantage of employing the L-HDDR process is a relatively a low temperature would reduce the cost of treatment that is a very important factor for producing large amount of material. Thus, the L-HDDR process has been considered a promising alternative method of reducing graphene oxide with efficiency and possibly in large scale production.