化学还原氧化石墨烯

产品说明

专注研发，只为更高品质

一、产品概述

1. 本品是以氧化石墨烯为原料，经过昂星新碳研发的特殊化学还原工艺处理得到的化学还原氧化石墨烯（Chemical Reduced Graphene oxide），简称CRG。

2. 本品具有纯度高、电导率优异、比表面积大、稳定性高等优点，且与有机和无机材料相容性较好，易于分散和研磨，适合应用于高分子复合材料、涂料涂层、包覆材料和润滑材料等领域。

二、产品参数

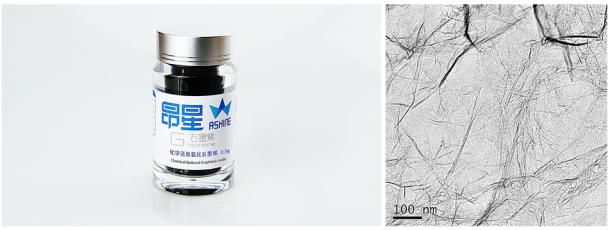

图1. 昂星CRG产品和TEM图谱

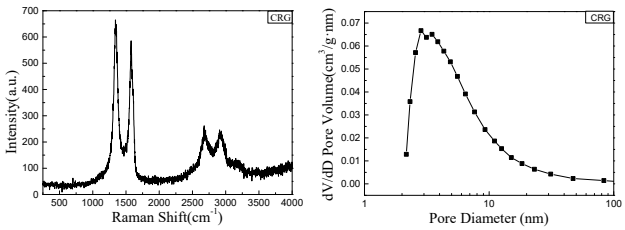

图2. 昂星CRG产品Raman和孔径分布分析

产品编号	CRG1210	CRG2210
形貌	黑色蓬松粉体	黑色蓬松粉体
厚度（nm）	~1	~1
单层片径（μm）	0.5~10	0.5~10
碳含量（wt.%）	~83.4	~82
氧含量（wt.%）	~7.6	~5.4
灰分（wt.%）	<1.0	<1.0
振实密度（g/L）	~13.6	~11.6
电导率（S/m）	~1200	~5000
比表面积（m^2/g）	~300	~180

三、产品性质说明

1. 分散性能：CRG是氧化石墨烯化学还原后得到的，其中大部分含氧官能团已经被去除，分散性能降低。在杆式超声条件下，选用水、DMF、NMP、DMSO等溶剂进行粉碎性分散，可获得CRG的相应溶剂分散液。

2. 电导率：相比于氧化石墨烯，CRG的缺陷在很大程度上被修复，导电性能有了明显的提升。相对于其他还原石墨烯， CRG在电导率上也具有明显的优势。

3. 比表面积：CRG经过昂星新碳特殊工艺处理之后，粉体能够保持蓬松状态，具有较高的比表面积。

4. 化学还原石墨烯与热还原石墨烯的区别：虽然两者的原料来源相近，但化学还原石墨烯的缺陷修复效果更好，电导率有非常明显的提升。

5. 化学还原石墨烯与机械剥离石墨烯的区别：化学还原的石墨烯原料来自于氧化石墨烯，所以导电性能没有机械剥离石墨烯高；但其片径尺寸、片层厚度以及比表面积均有一定程度的提高。

四、应用情境举例

相对于常规石墨烯，CRG还保有部分含氧官能团，同时稳定性方面又明显好于氧化石墨烯，作为吸附材料，吸附重金属以及有机染料都有非常明显的效果。

图3. CRG产品作为吸附材料示意图

五、注意事项

使用安全：本款石墨烯粉体易飘散，对人体的肺及呼吸道有害，使用过程中请做好相应的粉尘防护。

贮存运输：本品室温下密封保存（＜30℃）。包装瓶为PS材质，请远离热源。请勿与有机溶剂接触。
本说明书为简要产品说明，具体产品说明请登录公司网站 ***www.ashinecarbon.com*** 查看及下载。

如果对上述内容存在任何疑问或需要相关文献，欢迎联系我们：***Sales@ashinecarbon.com***

Chemical Reduced Graphene Oxide

Product Information

ASHINE

FOCUS ON R&D
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I. Product Overview

1. Developed by Ashine with a special chemical reduction process, this product consists of chemical reduced graphene oxide with graphene oxide as the raw material. It is referred to as 'CRG' for short.

2. The product has such advantages as high purity, excellent conductivity, high specific surface area, high stability, good compatibility with organic and inorganic materials and dispersion and grinding convenience. It is suitable for application in polymer composite materials, painting and coatings, cladding materials, lubricating materials, etc..

II. Product Parameters

Product Number	CRG1210	CRG2210
Form	Black fluffy powder	Black fluffy powder
Thickness (nm)	~1	~1
Monolayer diameter (μm)	0.5~10	0.5~10
Carbon content (wt.%)	~83.4	~82
Oxygen content (wt.%)	~7.6	~5.4
Ash content (wt.%)	<1.0	<1.0
Tap density (g/L)	~13.6	~11.6
Electric conductivity (S/m)	~1200	~5,000
BET (m^2/g)	~300	~180

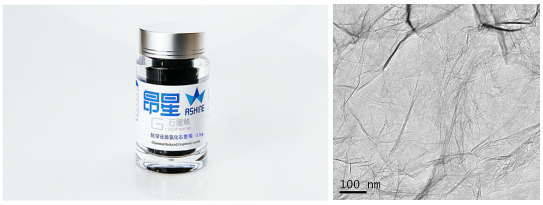

Fig. 1. Ashine CRG Products and TEM Images

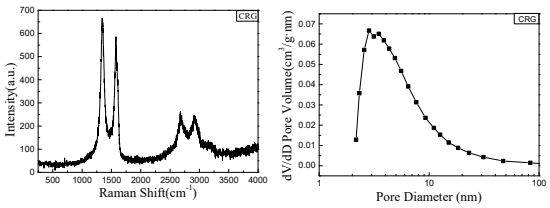

Fig. 2. Ashine CRG Product Raman and Pore Size Distribution Analysis

III. Description of Product Properties

1. Dispersion: CRG is obtained from the chemical reduction of graphene oxide, during which most of the oxygen-containing functional groups are removed and the dispersibility is reduced. Under rod-type ultrasonic conditions, water, DMF, NMP, DMSO and other solvents can be used for crushing dispersion to obtain the corresponding solvent dispersion of CRG .

2. Electric conductivity : Compared with graphene oxide, the defects of CRG have been repaired to a great extent and its electric conductivity has been greatly improved. In addition, CRG has obvious conductivity advantages compared with other chemically reduced graphene.

3. Specific surface area: After processing by special CRG technology, the powder remains fluffy and has a high specific surface area.

4. Difference between chemical reduced graphene and thermal reduced graphene: Although their sources of raw material are similar, the defect repair effect of chemical reduced graphene is better and the conductivity is markedly improved.

5. Difference between chemical reduced graphene and mechanical peeling graphene: the raw material of chemical reduced graphene comes from graphene oxide, so its conductivity is not higher than that of mechanical peeling graphene; but its size, thickness and specific surface area values are improved to a certain extent.

IV. Application Example

Compared with conventional graphene, CRG retains some oxygen-containing functional groups and its stability is better than that of graphene oxide. As an adsorbent, it shows obvious adsorption of heavy metals and organic dyes.

Fig. 3. CRG Products as Adsorbent Diagram

V. Notice

Safe use: CRG is prone to floating and can be harmful to the lungs and respiratory tract. Please ensure appropriate dust protection when it is used.

Storage and transportation: This product is sealed at room temperature. The packing bottle is PS material. Please keep away from heat sources and any organic solvents.

This manual is a brief product description. Please visit the company's website at www.ashinecarbon.com to view and download a detailed product description.If you have any questions about the above or require the relevant literature, please contact us at Sales@ashinecarbon.com.