

Supplementary information

Nanostructured micro/mesoporous graphene: Removal performance of volatile organic compounds

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Preparation of the pre-packed TEGOs filter

A pre-packed filter was prepared in an enclosed polypropylene filter loaded with 150 mg TEGOs. The size of the pre-packed TEGOs should match the diameter of the test loop, ensuring that the contact surface of the adsorbent with the adsorbate is sufficient.

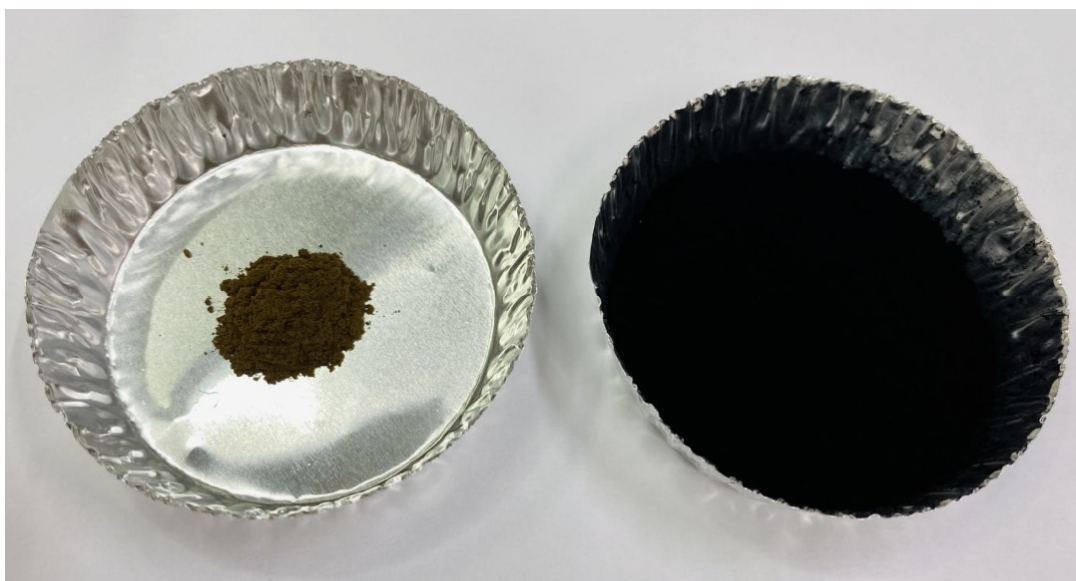


Figure S1. The volumetric expansion of TEGO compared with GO with the same weight of 0.1 g. Graphene planes split after thermal treatment, and the space between the layers widens as the temperature rises. This indicates volumetric expansion as well as an increase in the specific surface area of the TEGO.

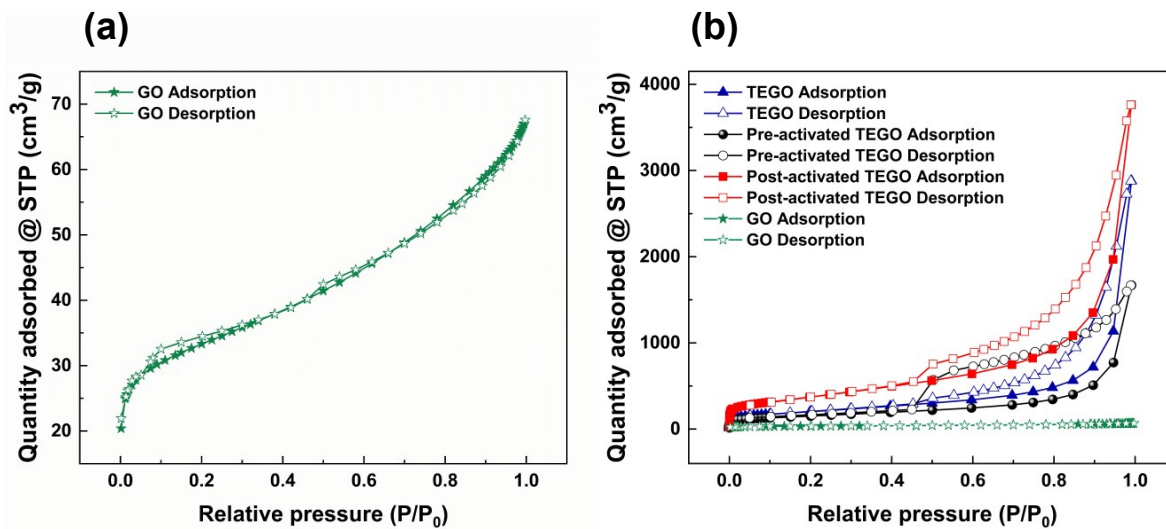


Figure S2. The nitrogen adsorption-desorption isotherm of GO (a) and graphene-based adsorbents (b).

Physical adsorption depends mostly on their specific surface area and pore structure in terms of porous adsorbents. However, there is low SSA on the GO surface characteristics and practically no porosity. Thus, we included the surface characteristics of GO in Table S1 in order to compare the adsorbents of TEGOs and their nitrogen adsorption-desorption isotherm as given in Figure S2.

Pore characteristic of graphene-based materials

Table S1. Surface parameters of as-prepared adsorbents

Adsorbent	S_{BET} (m ² /g)	V_p (cm ³ /g)	Average pore size (nm)
GO	113.41	0.10	3.62
TEGO	692.44	2.51	12.86
Pre-activated TEGO	517.87	2.60	9.97
Post-activated TEGO	1261.46	2.64	9.22