

## Supplementary materials

for

### Enhanced adsorption of malathion and phoxim by a three-dimensional magnetic graphene oxide-functionalized citrus peel-derived bio-composite

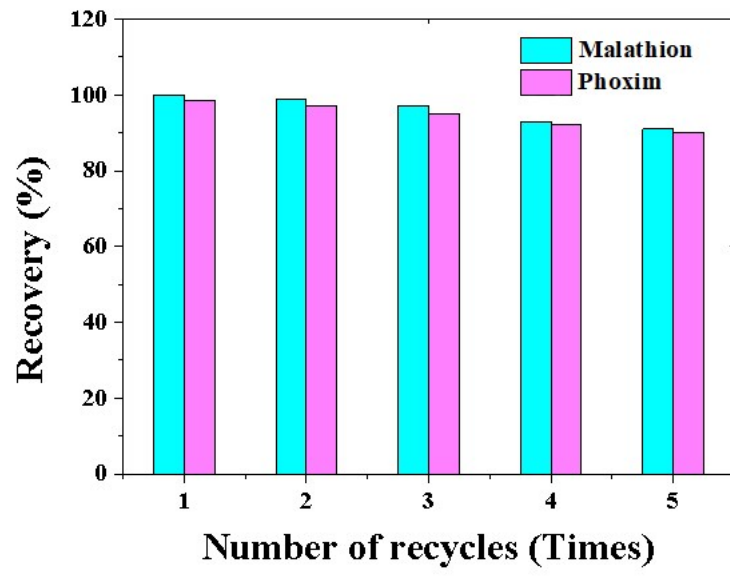
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**Fig. S1.** Reusability of mGOBC adsorbents.

Table S1 The R, LOD and LOQ of two OPP in broccoli, lettuce and tomato.

Pesticides	R			LOD ( $\mu\text{g kg}^{-1}$ )			LOQ ( $\mu\text{g kg}^{-1}$ )		
	Broccoli	Lettuce	Tomato	Broccoli	Lettuce	Tomato	Broccoli	Lettuce	Tomato
Malathion	0.999	0.998	0.996	0.01	0.03	0.02	0.03	0.11	0.09
Phoxim	0.999	0.997	0.998	0.13	0.09	0.11	0.43	0.32	0.35

Table S2 The accuracy and precision for the determination of two OPP in vegetable samples (n=6).

Pesticides	Concentration ( $\mu\text{g kg}^{-1}$ )	Accuracy			Intra-day RSD (%)			Inter-day RSD (%)		
		Recovery (%)			Broccoli	Lettuce	Tomato	Broccoli	Lettuce	Tomato
		Broccoli	Lettuce	Tomato						
Malathion	2	101.6	99.5	100.3	1.8	2.6	5.4	1.9	2.8	5.1
	5	99.2	95.8	96.6	3.2	6.9	4.8	2.0	5.9	4.5
	10	100.3	99.0	98.1	4.6	3.1	3.4	1.1	3.2	3.8
Phoxim	2	99.6	95.4	97.2	0.6	5.9	0.3	1.2	6.1	5.4
	5	99.4	89.8	99.5	1.0	6.4	1.4	2.0	5.9	6.2
	10	97.1	99.3	99.3	2.6	2.8	3.2	0.5	3.3	6.8

Table S3 Residues in real vegetable samples ( $\mu\text{g kg}^{-1}$ )

Compounds	Pesticides	Concentration ( $\mu\text{g kg}^{-1}$ )	Spiked level ( $\mu\text{g kg}^{-1}$ )	Recovery (%)
Broccoli	malathion	ND	5	96.31
	phoxim	ND	5	98.35
Lettuce	malathion	0.02	5	98.31
	phoxim	ND	5	89.73
Tomato	malathion	ND	5	97.24
	phoxim	ND	5	96.36
Cowpea	malathion	ND	5	92.75
	phoxim	ND	5	94.62
Purple cabbage	malathion	0.03	5	99.34
	phoxim	ND	5	93.91

Table S4 Comparisons of food sample preparation methods.

Sample	adsorbent	Adsorption capability (mg g <sup>-1</sup> )	Recovery (%)	LOD (µg kg <sup>-1</sup> )	RSD (%)	Reference
Vegetables	mGOBC	25.26 for malathion 42.31 for phoxim	89.8-101.6	0.01-0.13	0.3-6.9	This method
Milk	M-RACNTs	1.61 for malathion	No data	0.36-0.95	10.47-19.85	[45]
Water	COF	21.3 for phosalone 23.3 for phosmet 18.8 for coumaphos	72.8-111.0	0.02-0.63	0.5-11.4	[46]
Vegetable oils	MIP	1.00 for malathion	73-99	0.08-0.6	No data	[47]
Water	GCS	4.88 for malathion	-	-	-	[42]
Water	G/Fe <sub>3</sub> O <sub>4</sub> @SiO <sub>2</sub>	-	89.3–117.2	10–24	0.5-10.5	[48]

M-RACNTs: Magnetic restricted-access carbon nanotubes

COF: Magnetic covalent organic framework

MIP: Molecular imprinting