

Table S1. Sorption and desorption parameters with statistical indices estimated by Pseudo First-Order (PFOM) nonlinear kinetics models describing the sorption/desorption processes of acetamiprid and thiacloprid in experimental soils.

Fitted/statistical parameter	Sorption				Desorption				
	S1	S2	S3	S4	Fitted/statistical parameter	S1	S2	S3	S4
Acetamiprid									
$k^{\text{sor}} \text{ (a)}$	7.8171	3.5941	6.7223	6.9781	$k^{\text{des}} \text{ (b)}$	0.9164	0.4260	0.0496	0.0492
(1/h)	(±0.1587)	(±0.0718)	(±0.1031)	(±0.1189)	(1/h)	(±0.0209)	(±0.0128)	(±0.0150)	(±0.0165)
$q_{\text{eq}}^{\text{sor}} \text{ (c)}$	71.43	52.99	64.17	65.88	$q_{\text{eq}}^{\text{des}} \text{ (d)}$	71.27	43.62	58.64	60.37
(mg/kg)	(±1.42)	(±0.88)	(±1.41)	(±1.24)	(mg/kg)	(±0.24)	(±0.65)	(±0.83)	(±0.87)
$R^2 \text{ (e)}$	0.9973	0.9981	0.9961	0.9976	$R^2 \text{ (e)}$	0.9999	0.9995	0.9999	0.9999
SRMSE ^(f)	0.0581	0.0463	0.0660	0.0518	SRMSE ^(f)	0.0069	0.0215	0.0115	0.0112
err-% ^(g)	4.67	3.71	5.30	4.16	err-% ^(g)	0.58	1.81	0.97	0.99
Thiacloprid									
$k^{\text{sor}} \text{ (a)}$	9.2870	3.3871	4.2017	7.0723	$k^{\text{des}} \text{ (b)}$	0.5634	0.1214	0.2613	0.2652
(1/h)	(±0.8146)	(±0.1635)	(±0.3372)	(±0.1242)	(1/h)	(±0.0874)	(±0.0316)	(±0.0822)	(±0.0522)
$q_{\text{eq}}^{\text{sor}} \text{ (c)}$	97.83	74.35	86.77	91.15	$q_{\text{eq}}^{\text{des}} \text{ (d)}$	96.46	68.25	81.33	91.46
(mg/kg)	(±0.67)	(±0.63)	(±1.10)	(±0.96)	(mg/kg)	(±0.06)	(±0.46)	(±0.41)	(±0.11)
SRMSE ^(f)	0.0191	0.0231	0.0348	0.0290	SRMSE ^(f)	0.0012	0.0083	0.0076	0.0018
err-% ^(g)	1.53	1.86	2.78	2.33	err-% ^(g)	0.10	0.70	0.64	0.15

(a), (b), (c), (d) – rate constants or sorbed/desorbed amount obtained by modelling with Pseudo-First Order (PFOM); (e) – coefficient of multiple determination ^(f) – Scaled Root Mean Squared Error; (g) – minimum error level of χ^2 test