

Supporting Information

Improving Surface Imprinting Effect by Reducing Nonspecific Adsorption on Non-imprinted Polymer Films for 2,4-D Herbicide Sensors

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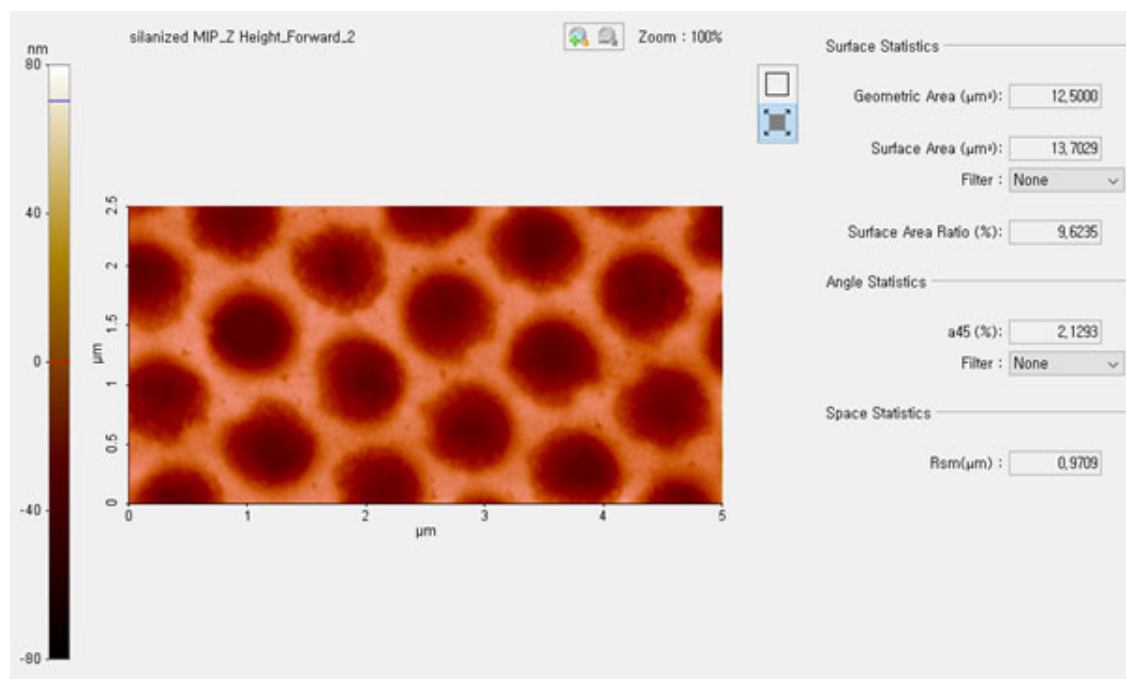


Figure S1. Surface analysis of the *st*-MIP film. The patterned surface area (13.7029 μm^2) on the scanned area (12.5 μm^2) indicates an increased aspect ratio of 1.096 (A/A_0) on the defined area.

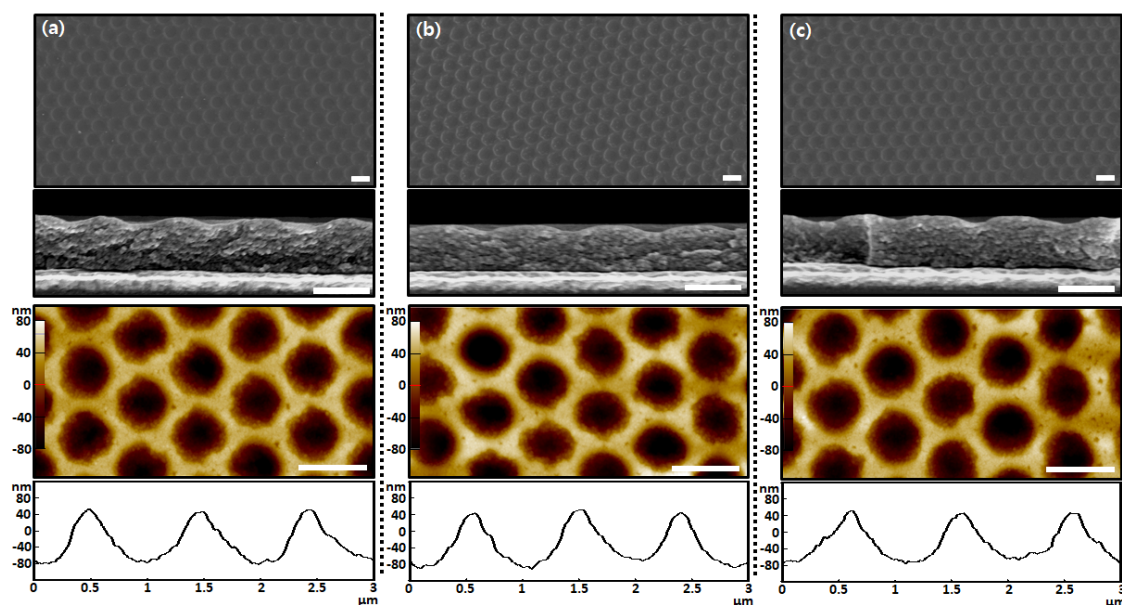


Figure S2. SEM (lower: cross-sectional image) and AFM images (line profilometry is included below the AFM image) of the (a) *st*-NIP, (b) *n*-MIP, and (c) *n*-NIP films. All the scale bars are 1 μm.

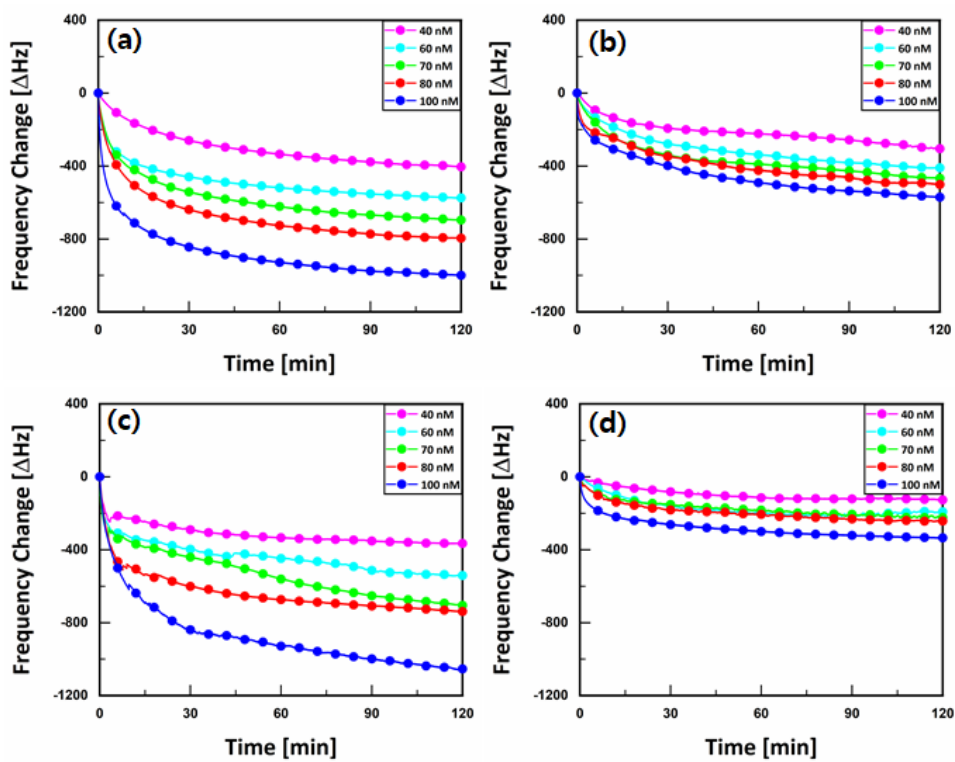


Figure S3. Frequency change as a function of time on the (a) *n*-MIP, (b) *n*-NIP, (c) *st*-MIP, and (d) *st*-NIP films in a variety of 2,4-D concentrations (40–100 nM) for a 2-h rebinding process.

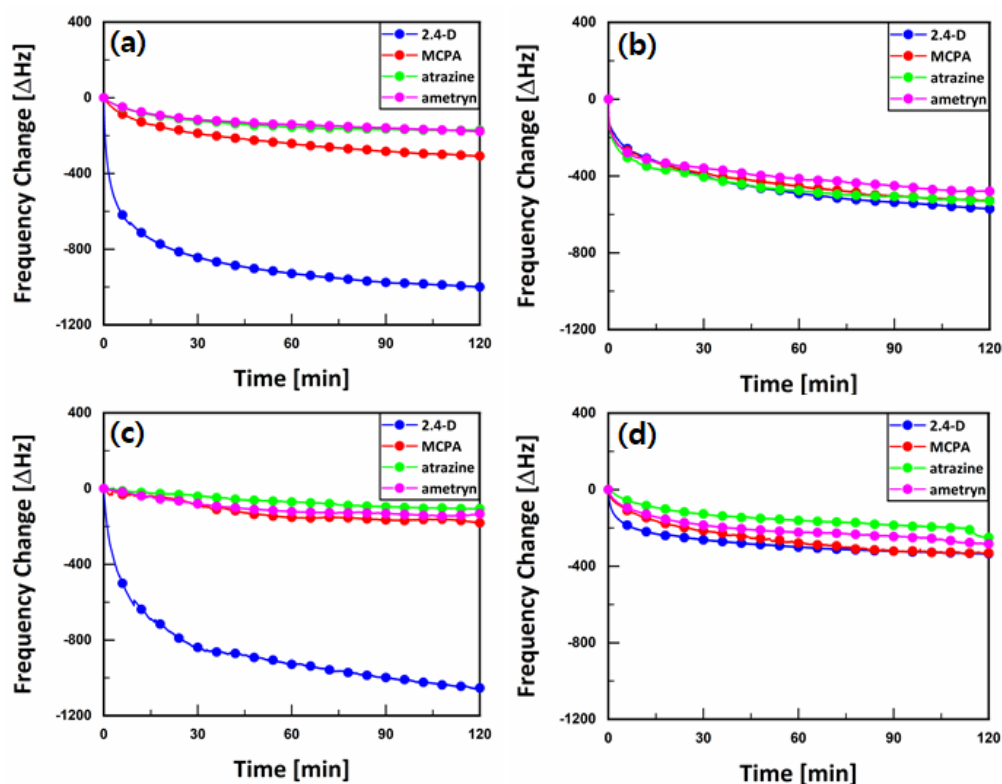


Figure S4. Frequency change as a function of time on the (a) *n*-MIP, (b) *n*-NIP, (c) *st*-MIP, and (d) *st*-NIP films in each analogous herbicide solution (namely, 2,4-D, MCPA, atrazine, or ametryn) with a fixed concentration (100 nM) for the 2-h rebinding process.

Table S1. Adsorbed mass, template-free polymer weight, and Q_e values on the *st*-MIP/NIP and *n*-MIP/NIP films.

	<i>st</i> -MIP			<i>st</i> -NIP			<i>n</i> -MIP			<i>n</i> -NIP		
	Analyte (ng)	Polymer (μ g)	Q_e (ng/ μ g)	Analyte (ng)	Polymer (μ g)	Q_e (ng/ μ g)	Analyte (ng)	Polymer (μ g)	Q_e (ng/ μ g)	Analyte (ng)	Polymer (μ g)	Q_e (ng/ μ g)
2,4-D	1127.48	11.13	101.3	358.92	12.46	28.8	1069.45	10.60	100.9	611.22	11.90	51.4
Atrazine	113.42	11.13	10.2	267.51	12.46	21.5	184.17	10.60	17.4	568.20	11.90	47.8
MPCA	193.51	11.13	17.4	354.53	12.46	28.5	329.06	10.60	31.1	565.31	11.90	47.5
Ametryn	142.06	11.13	12.8	303.48	12.46	24.4	190.05	10.60	17.9	513.56	11.90	43.2

Analyte: adsorbed mass (ng)

Polymer: template-free polymer weight (μ g)

Table S2. Selectivity coefficients (k^*) and relative coefficients (k') of 2,4-D-imprinted and non-imprinted QCM sensors.

	<i>st</i> -MIP		<i>st</i> -NIP		k'_1	<i>n</i> -MIP		<i>n</i> -NIP		k'_2
	Q_e	$k_{1,MIP}^*$	Q_e	$K_{1,NIP}^*$		Q_e	$k_{2,MIP}^*$	Q_e	$k_{2,NIP}^*$	
2,4-D	101.3		28.8		–	100.9		51.4		–
Atrazine	10.2	9.93	21.5	1.34	7.41	17.4	5.80	47.8	1.08	5.37
MPCA	17.4	5.82	28.5	1.01	5.76	31.1	3.24	47.5	1.08	3.00
Ametryn	12.8	7.91	24.4	1.18	6.70	17.9	5.64	43.2	1.19	4.74

k^* (equilibrium binding coefficient) = $Q_e(2,4-D)/Q_e(\text{analogous species})$

k' (relative selectivity coefficient) = $k'_{(imprinted)}/k'_{(non-imprinted)}$