Electronic Supplementary Material (ESI) for Environmental Science: Processes & Impacts.

Appendix A: Supplementary Information

The Key Constituents Underlying the Combined Toxicity of Eight Cosmetic Contaminants towards *Vibrio qinghaiensis*

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Table S1 CRCs fitting functions (Weibull, *W*), parameters, statistics and EC_{50} values for Q67 by ten mixture rays

Rays	Time(h)	Function	α	β	*RMSE*[a]	*R*[b]	EC_{50}(mol/L)	pEC_{50}
	0.25	*W*	6.38	2.04	0.041	0.9919	4.93×10^{-4}	3.31
	2	*W*	6.49	2.13	0.044	0.9903	6.04×10^{-4}	3.22
R1	4	*W*	7.08	2.43	0.039	0.9911	8.62×10^{-4}	3.06
	8	*W*	10.07	3.59	0.030	0.9939	1.24×10^{-3}	2.91
	12	*W*	19.58	7.20	0.057	0.9816	1.70×10^{-3}	2.77
	0.25	*W*	6.62	2.33	0.037	0.9920	1.00×10^{-3}	3.00
	2	*W*	7.66	2.76	0.040	0.9905	1.24×10^{-3}	2.91
R2	4	*W*	11.01	4.05	0.060	0.9878	1.55×10^{-3}	2.81
	8	*W*	13.62	5.12	0.041	0.9883	1.85×10^{-3}	2.73
	12	*W*	19.99	7.75	0.060	0.9773	2.36×10^{-3}	2.63
	0.25	*W*	6.54	1.96	0.030	0.9956	2.99×10^{-4}	3.52
	2	*W*	6.42	1.98	0.025	0.9966	3.74×10^{-4}	3.43
R3	4	*W*	6.84	2.20	0.022	0.9972	5.30×10^{-4}	3.28
	8	*W*	9.37	3.13	0.027	0.9957	7.75×10^{-4}	3.11
	12	*W*	12.78	4.36	0.037	0.9925	9.65×10^{-4}	3.02
	0.25	*W*	5.62	1.97	0.040	0.9890	9.14×10^{-4}	3.04
	2	*W*	6.69	2.43	0.035	0.9917	1.25×10^{-3}	2.90
R4	4	*W*	8.64	3.24	0.020	0.9976	1.66×10^{-3}	2.78
	8	*W*	10.50	4.02	0.037	0.9883	1.98×10^{-3}	2.70
	12	*W*	16.10	6.27	0.052	0.9807	2.36×10^{-3}	2.63
	0.25	*W*	5.72	1.95	0.024	0.9961	7.56×10^{-4}	3.12
	2	*W*	6.65	2.29	0.028	0.9951	8.63×10^{-4}	3.06
R5	4	*W*	9.00	3.16	0.026	0.9964	1.09×10^{-3}	2.96
	8	*W*	10.71	3.89	0.033	0.9956	1.42×10^{-3}	2.85
	12	*W*	12.82	4.72	0.035	0.9931	1.61×10^{-3}	2.79
	0.25	*W*	6.38	2.13	0.013	0.9991	6.80×10^{-4}	3.17
	2	*W*	7.48	2.54	0.016	0.9988	8.14×10^{-4}	3.09
R6	4	*W*	11.37	3.97	0.053	0.9925	1.11×10^{-3}	2.96
	8	*W*	10.85	3.84	0.040	0.9943	1.20×10^{-3}	2.92
	12	*W*	14.42	5.25	0.035	0.9903	1.53×10^{-3}	2.82
	0.25	*W*	6.14	1.99	0.028	0.9955	5.38×10^{-4}	3.27
	2	*W*	6.88	2.27	0.035	0.9937	6.42×10^{-4}	3.19
R7	4	*W*	8.90	3.00	0.029	0.9970	8.15×10^{-4}	3.09
	8	*W*	10.89	3.77	0.027	0.9967	1.03×10^{-3}	2.99
	12	*W*	12.15	4.27	0.031	0.9948	1.17×10^{-3}	2.93
	0.25	*W*	6.09	2.17	0.018	0.9981	1.06×10^{-3}	2.98
	2	*W*	6.89	2.46	0.026	0.9962	1.12×10^{-3}	2.95
R8	4	*W*	8.28	3.02	0.023	0.9979	1.37×10^{-3}	2.86
	8	*W*	9.94	3.66	0.025	0.9973	1.53×10^{-3}	2.82
	12	*W*	16.54	6.25	0.053	0.9874	1.97×10^{-3}	2.71
	0.25	*W*	6.60	1.90	0.017	0.9985	2.15×10^{-4}	3.67
	2	*W*	7.14	2.08	0.027	0.9964	2.46×10^{-4}	3.61
R9	4	*W*	8.54	2.57	0.035	0.9946	3.42×10^{-4}	3.47
	8	*W*	8.63	2.68	0.024	0.9970	4.40×10^{-4}	3.36
	12	*W*	10.83	3.47	0.036	0.9935	5.93×10^{-4}	3.23
	0.25	*W*	6.29	2.08	0.020	0.9980	6.31×10^{-4}	3.20
	2	*W*	6.94	2.31	0.024	0.9974	6.87×10^{-4}	3.16
R10	4	*W*	7.77	2.64	0.037	0.9942	8.28×10^{-4}	3.08
	8	*W*	9.19	3.17	0.027	0.9974	9.67×10^{-4}	3.01
	12	*W*	14.98	5.32	0.051	0.9923	1.30×10^{-3}	2.88

[a] *RMSE* refers to root mean square error.

[b] *R* refers to correlation coefficient.

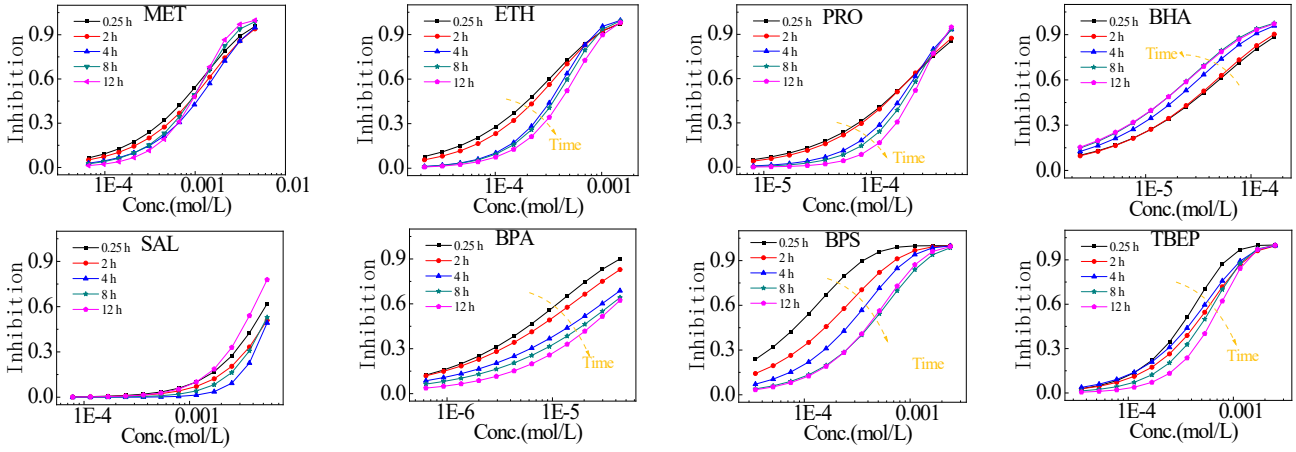
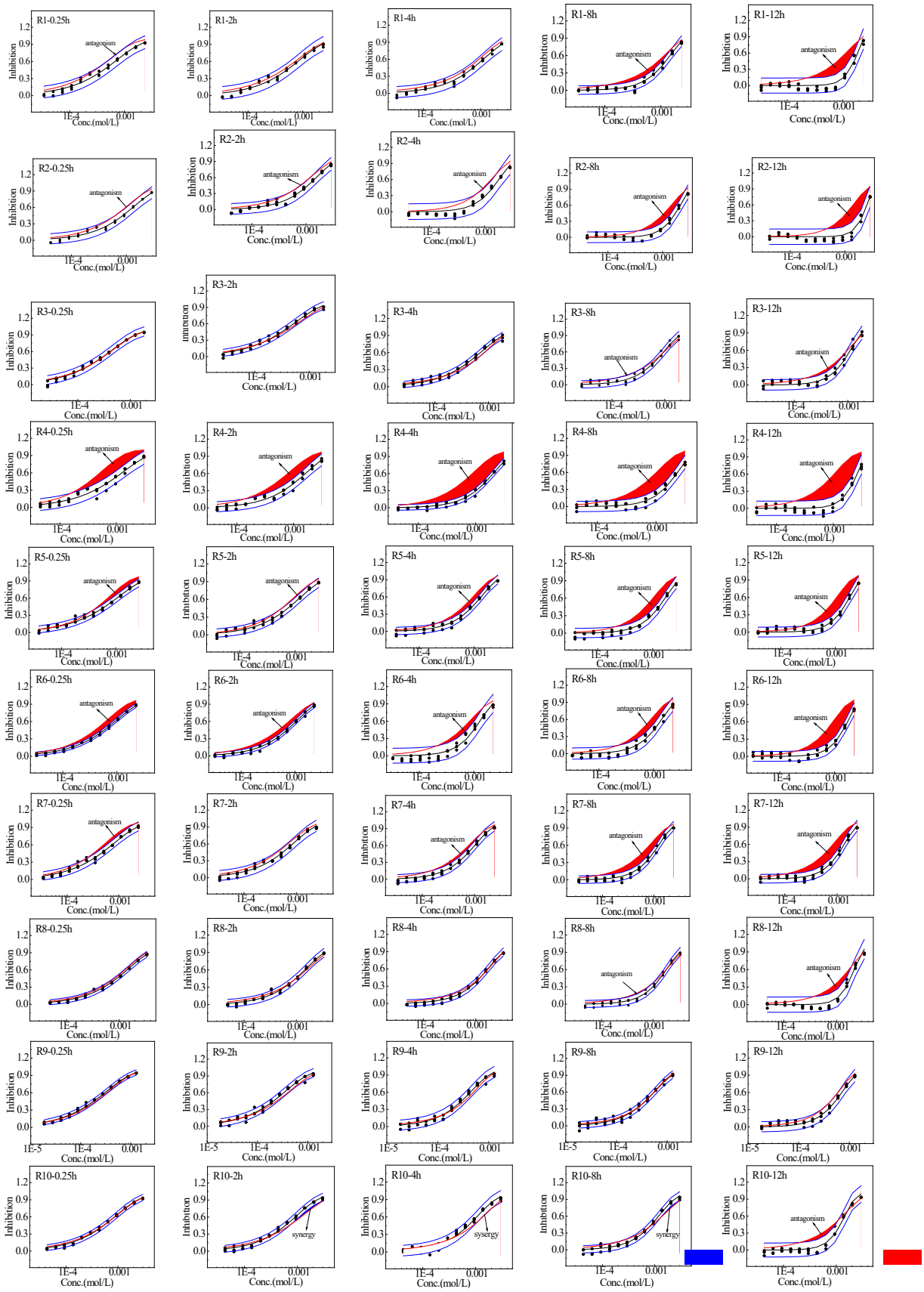


Fig. S1 The fitted CRCs of eight cosmetic pollutants on Q67



(●: observed data; —: fitted curve; —: CRCs predicted curve by CA; —: 95% confidence intervals; : synergistic region; : antagonistic region)

Fig. S2 The concentration-response relationship of ten rays in the mixture system towards Q67 in five exposure times of 0.25, 2, 4, and 12h