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# Photocatalytic Degradation of 2,4,4'-trichlorobiphenyl into Long-chain Alkanes Using Ag Nanoparticles Decorated Flower-like ZnO Microspheres

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**Part S1.** The compare of the experimental mass spectral with the standard samples (head to tail) of the five final products.

These Figures are directly exported from the software of the instrument.

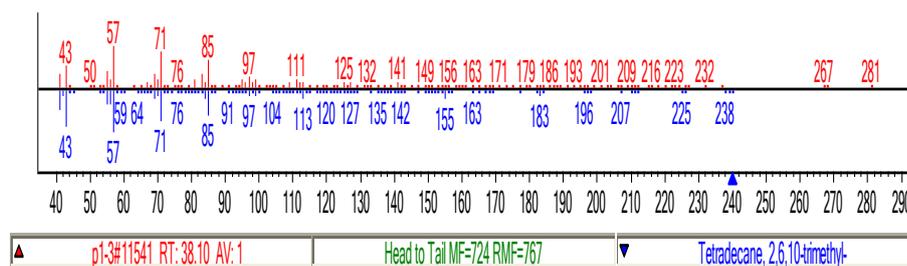


Figure S1. The compare of the experimental mass spectral at the RT= 38.10 (red) with the standard samples of the possible product (blue).

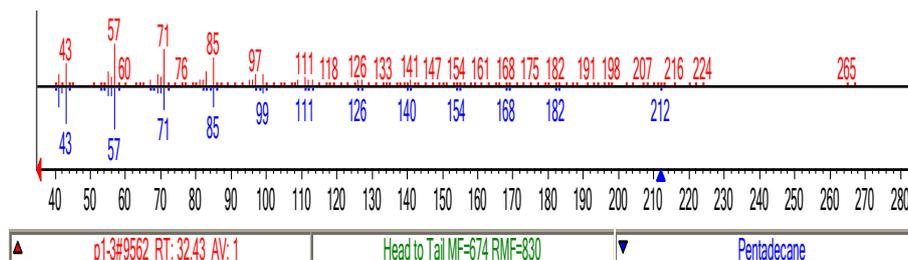


Figure S2. The compare of the experimental mass spectral at the RT= 32.42 (red) with the standard samples of the possible product (blue).

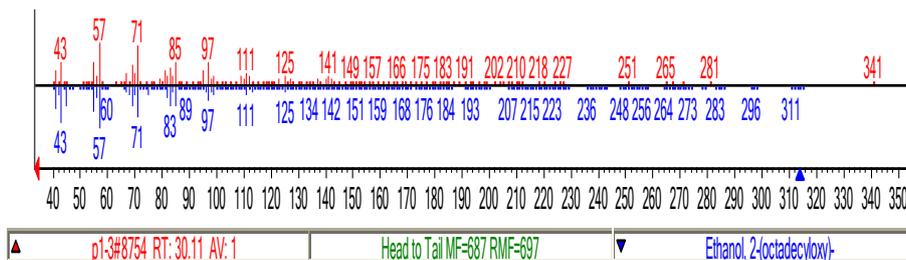


Figure S3. The compare of the experimental mass spectral at the RT= 30.11 (red) with the standard samples of the possible product (bule).

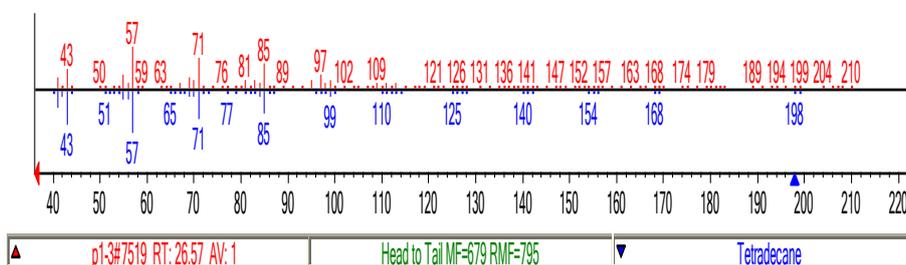


Figure S4. The compare of the experimental mass spectral at the RT= 26.57 (red) with the standard samples of the possible product (bule).

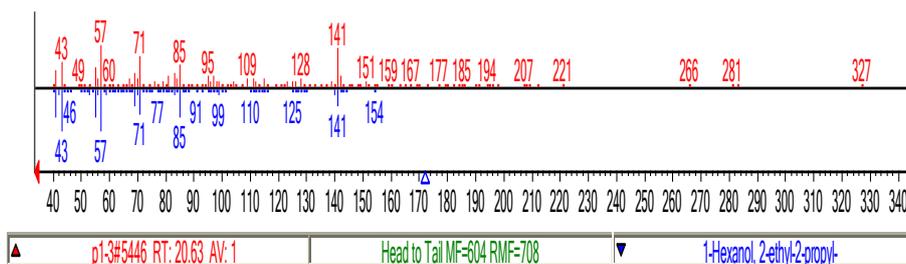


Figure S5. The compare of the experimental mass spectral at the RT= 20.63 (red) with the standard samples of the possible product (bule).

## Part S2. The three control groups

To estimate the self-photodegradation of PCB28 under ultraviolet light irradiation without the Ag-NPs@ZnOms photocatalyst, the control experiment marked as NoPC (remove the as-prepared photocatalyst and the other conditions unchanged) is designed. To estimate the photocatalytic degradation products of the acetone in the solvent via the as-prepared photocatalyst, the other control experiment (without the PCB28 and the other conditions unchanged, denoted as NoPCB) is designed. Additionally, to bar the interference of the reaction products in the dark condition, a dark control group is presented (without the UV irradiation and the other conditions unchanged, denoted as Dark).

**Table S1. The experimental design of the experimental group and the control groups**

	<i>Photocatalyst (Ag-NPs@ZnOms)</i>	<i>Solvent (acetone &amp; water)</i>	<i>Pollutant (PCB28)</i>	<i>UV irradiation</i>
Experimental group	√ [a]	√	√	√
Control group I (NoPC)		√	√	√
Control group II (NoPCB)	√	√		√
Control group III (Dark)	√	√	√	

[a] The manipulate applied in the corresponding experiment.

**Part S3.** The dark control group result

The dark control group is presented in dark condition for 90 min, keeping the other conditions unchanged with the experimental group. The intermediates and final products were analysed through GC-MS (TSQ Quantum XLS). The column (TR-pesticide, length: 30 m; I.D. 0.25 mm; film: 0.25  $\mu\text{m}$ ) temperature was programmed to increase from 70  $^{\circ}\text{C}$  (hold for 1 min) to 280  $^{\circ}\text{C}$  (hold for 5 min) with a rate of 20  $^{\circ}\text{C}/\text{min}$ . As shown in Fig. S1, there is only one obvious peak at the RT = 9.69 min, which is assigned to be PCB28 from the compare with the standard library, suggesting that the PCB28 cannot be degraded without light irradiation.

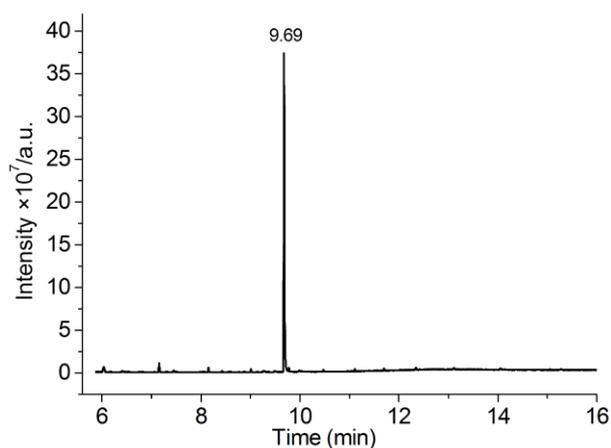


Figure S6. The total ion chromatograms of the intermediates of the dark control group.