Detection of Polycyclic Aromatic Hydrocarbons from Cooking Oil Using Ultra-Thin Layer Chromatography and Surface Enhanced Raman Spectroscopy

Supplementary Information

Jing Chen\textsuperscript{1,3}, Yao-wen Huang\textsuperscript{1,3}, and Yiping Zhao\textsuperscript{2,3}

1 Department of Food Science and Technology, University of Georgia, Athens, GA 30602, USA
2 Department of Physics and Astronomy, University of Georgia, Athens, GA 30602, USA
3 Nanoscale Science and Engineering Center, University of Georgia, Athens, GA 30602, USA.

\textbf{Figure S1} Principle component analysis of the Raman spectra of oil. Chili oil is grouped as a separate cluster whereas all other oil samples are grouped as one cluster.
Figure S2 Effect of partitioning conditions on the SERS intensity of extracted P. (a) SERS spectra of P in methanol solution and after extraction from oil and settling under different conditions: static settling for 5 and 30 min, and centrifugation for 1 min at 3000 rpm (b) Comparison of corresponding $I_{593}$. 
Figure S3 SERS spectra of BaA, BaP, and P in methanol solution (200 µg/mL). The peaks at $\Delta \nu = 724, 1384,\text{ and } 593 \text{ cm}^{-1}$ were selected to specifically indicate the presence of BaA, BaP, and P in this study. The spectra were normalized to the norm.
Figure S4 UTLC-SERS detection of PAHs 20% of water in methanol solution on unmodified substrates. (a) SERS spectra of PAH extracts from vegetable oil before UTLC, and corresponding chromatograms of (b) 100 µg/mL, (c) 500 µg/mL, and (d) 1 mg/mL of PAH mixtures extracted from vegetable oil.
Figure S5 UTLC-SERS detection of (a) 100 µg/mL, (b) 500 µg/mL, and (c) 1 mg/mL of PAHs extracted from vegetable oil using methanol on ME modified substrates