Supporting information

Uniform MF/Ag-NPs Core-Shell Composite Microspheres as Isolated SERS Substrates for Quick and Sensitive Detection of Insecticide

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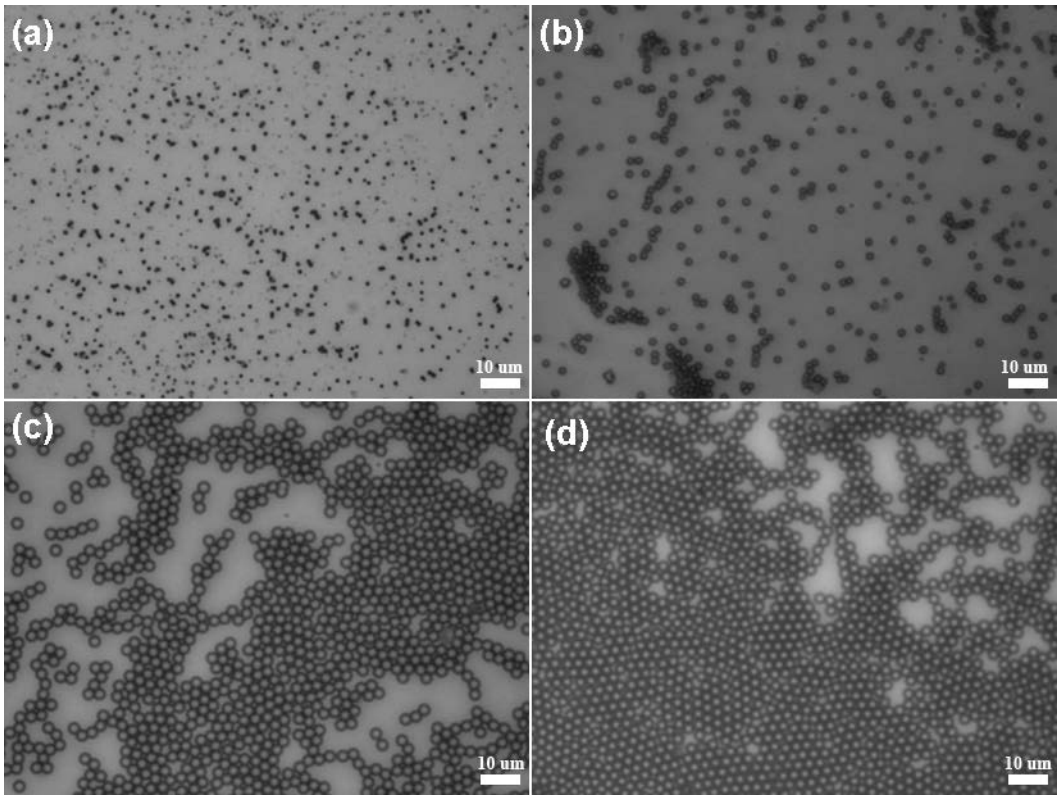

Figure S1. Optical images of the effect of reaction time on size of the MF microspheres: (a) 0.5 h, (b) 1.0 h, (c) 2.0 h, (d) 3.0 h; Melamine 0.625g, formaldehyde 0.9 g, temperature 60 °C, formic acid 10 μL.

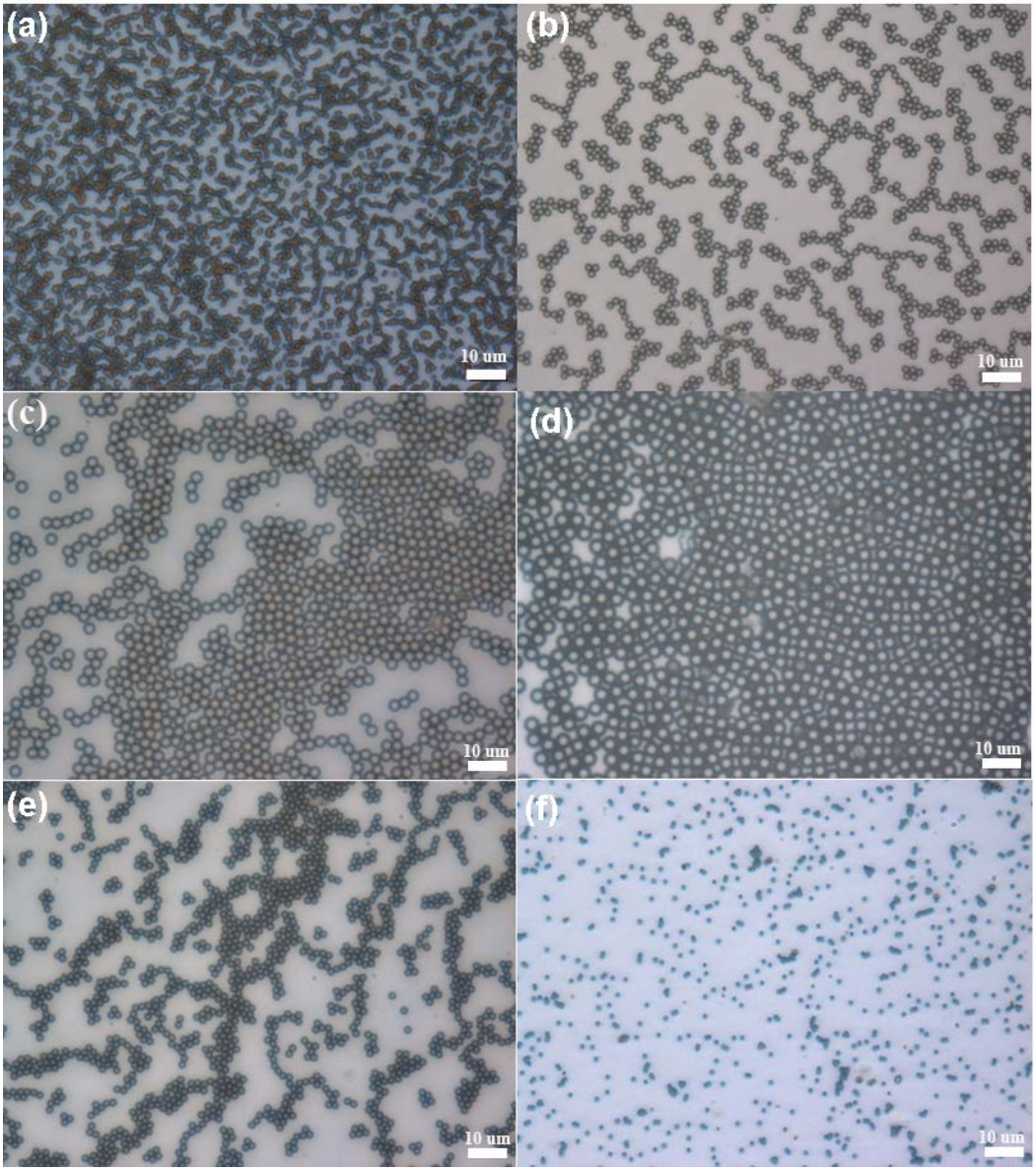

Figure S2. Optical images of the effect of reaction temperature on size of the MF microspheres: (a) 40 ˚C, (b) 50 ˚C, (c) 60 ˚C, (d) 70 ˚C, (e) 80 ˚C, (f) 100 ˚C; Melamine 0.625g, formaldehyde 0.9 g, formic acid 10 μL, reaction time 2 h, temperature

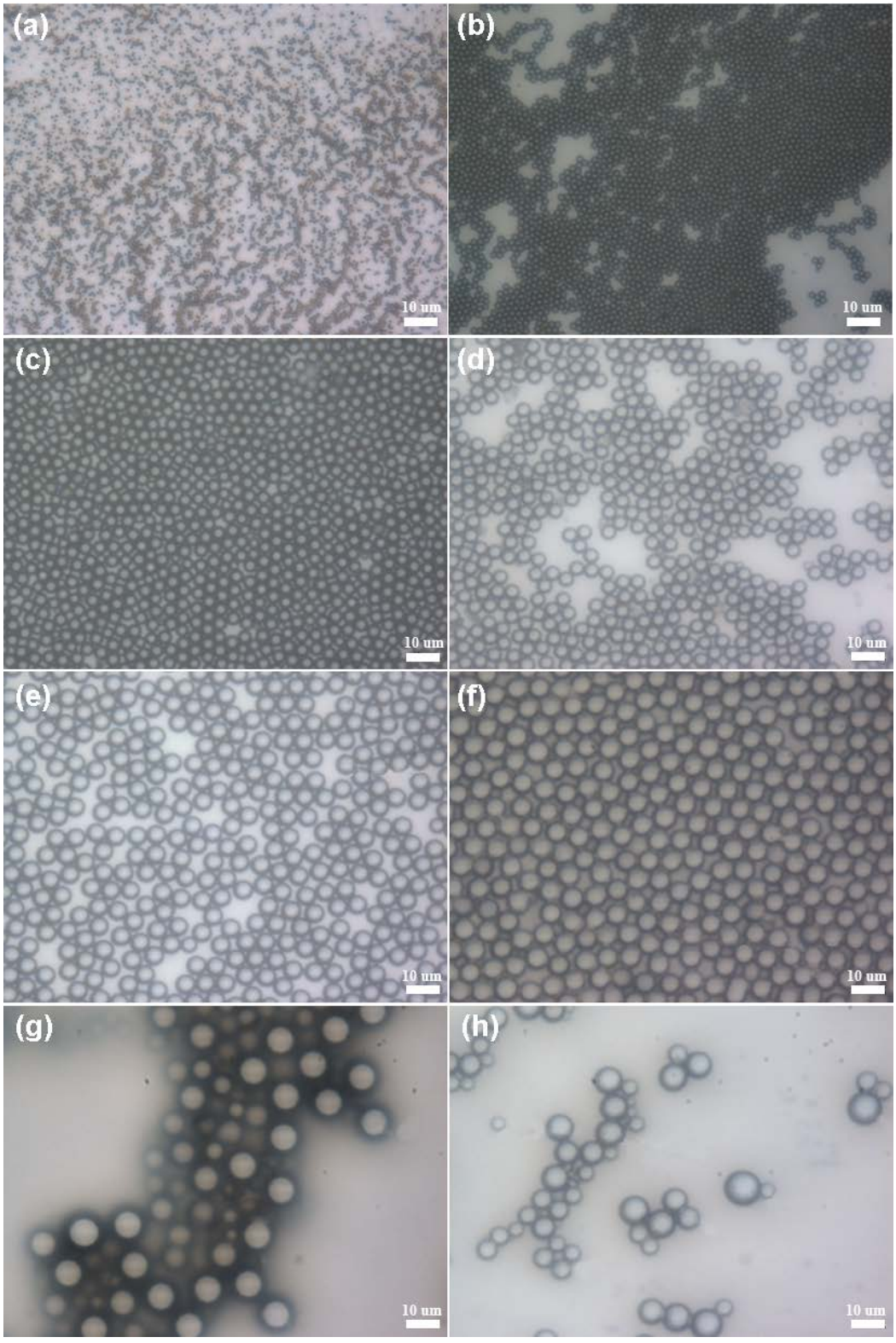

Figure S3. Optical images of the effect of formic acid amount on size of the MF microspheres: (a) 80 μL, (b) 25 μL, (c) 10 μL, (d) 7 μL, (e) 5 μL, (f) 4 μL. (g) 2.5 μL, (h) 1.5 μL; Melamine 0.625g, formaldehyde 0.9 g, temperature 70 ˚C, reaction time 2 h.

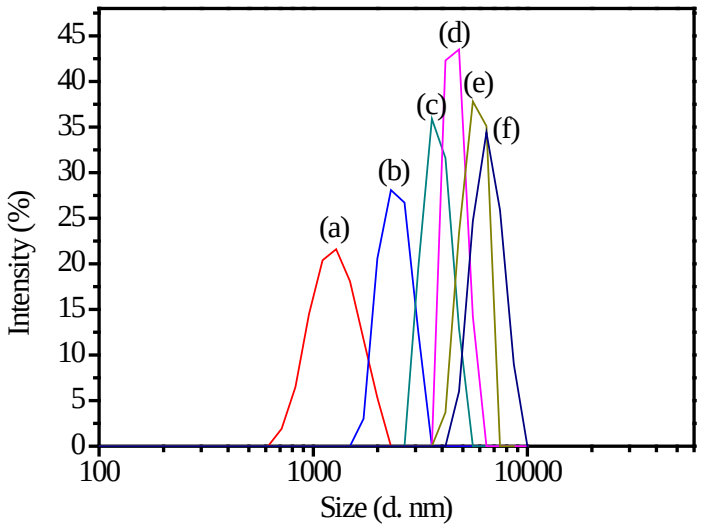

Figure S4. Hydrodynamic diameter distribution of the MF microspheres synthesized with different dosages of formic acid: (a) 50μL, (b) 25 μL, (c) 10 μL, (d) 7 μL, (e) 5 μL, (f) 4 μL; Melamine 0.625g, formaldehyde 0.9 g, temperature 70 ˚C, reaction time 2 h.

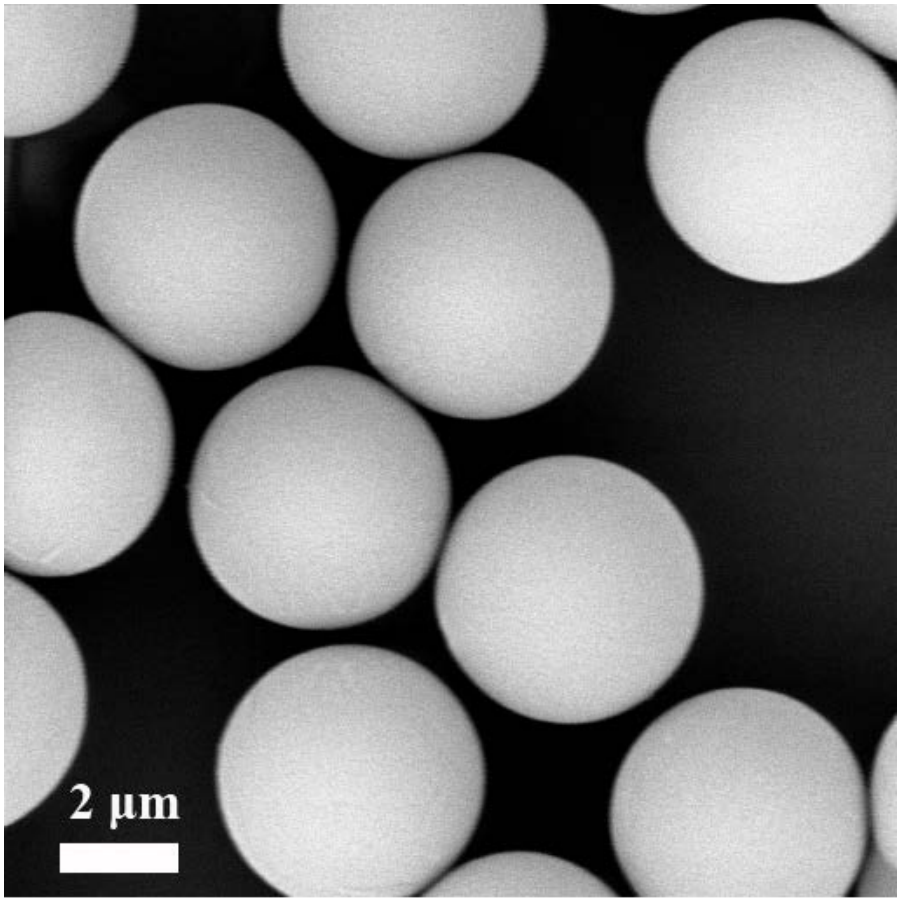

Figure S5. SEM image of the MF microspheres; Melamine 0.625g, formaldehyde 0.9 g, formic acid 7 µL, reaction temperature 70 °C, and reaction time 2 h.

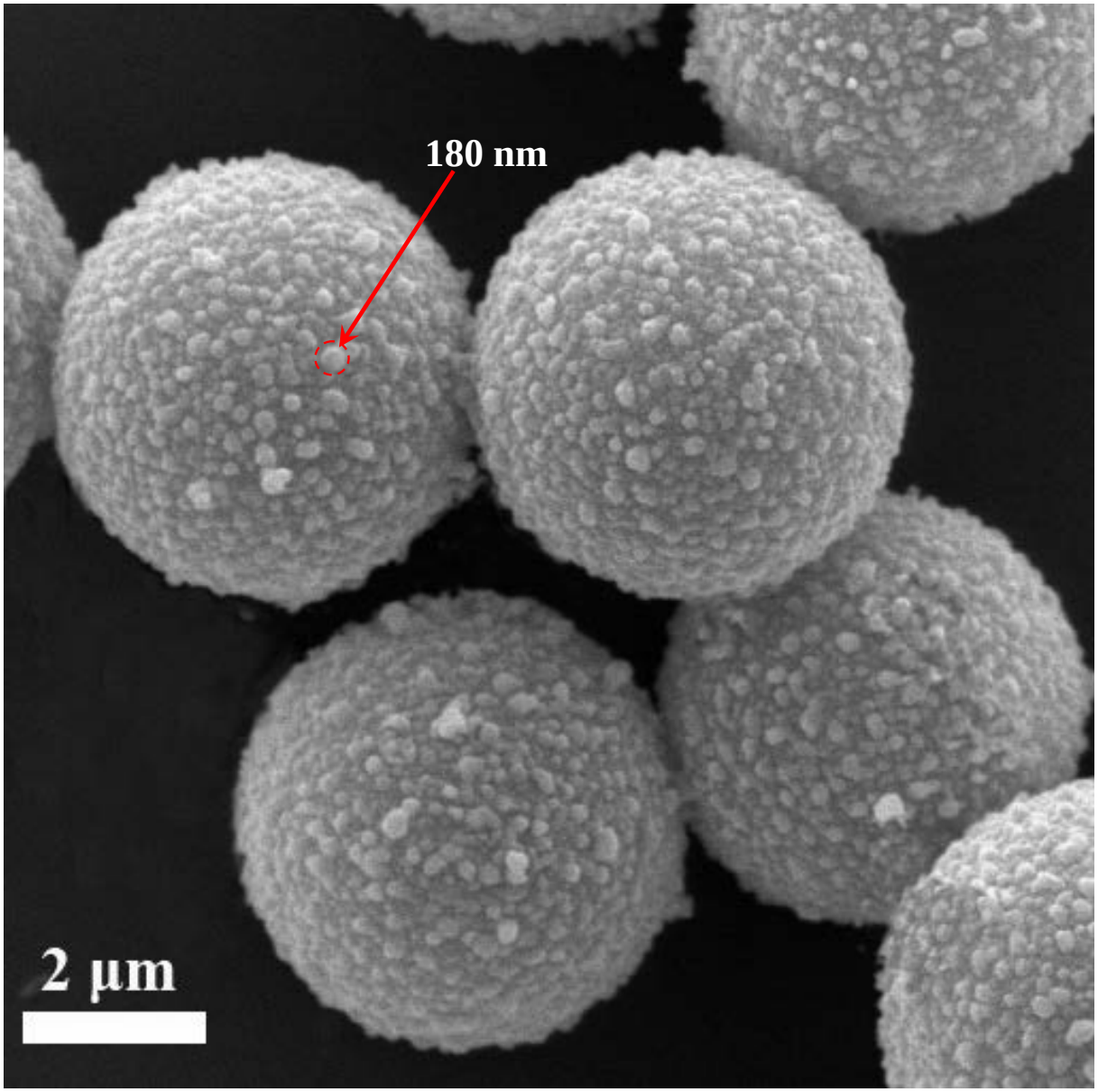

Figure S6. SEM image of the MF/Ag-NPs microspheres synthesized with 10:1 mass ratio of $AgNO_3$ to MF microspheres.

Table S1. Hydrodynamic diameter and polydispersity index (PDI) of the MF microspheres synthesized with different dosage of formic acid; Melamine 0.625g, formaldehyde 0.9 g, temperature 70 ˚C, reaction time 2 h.

Amount of formic acid (μL)	4	5	7	10	25	50
Average hydrodynamic diameter (μm)	6.87	5.32	4.84	3.82	2.77	1.33
PDI	0.65	0.12	0.05	0.07	0.21	0.42