

Supporting information section

Sample Name	Au SPR absorption	Ag SPR absorption
S1	533 nm	-
S2	529 nm	-
S3	527 nm	-
S4	526 nm	425 nm
S5	~523 nm	420 nm

Table S1. SPR absorption of samples S1 to S5

Sample name	pH of the solution	Au SPR absorption	Au@ZnO layer absorption
S6	10	~ 506 nm	~ 428 nm
S7	11	~ 502 nm	~ 406 nm
S8	12	~ 501 nm	~ 370 nm

Table S2. Absorption of Au@Ag@ZnO (samples S6 to S9)

Sample name	Au nanoparticle size (nm)	Ag layer thickness (nm)	ZnO layer thickness (nm)
S1	10-20	-	-
S2	10- 22	0.5-1	
S3	14-21	1-1.75	
S4	16-21	2-2.5	
S5	17-22	28-34	
S6	16-21	2-2.5	1-2.75
S7	16-20	2-2.5	2-3
S8	16-21	2-2.5	2.5-4

Table S3. Nanoparticle sizes and shell thickness