Layer-by-layer Self-assembly and Disassembly of Single Charged Inorganic Small Molecules: towards Surface Patterning

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1. UV-visible spectra of KAuCl₄ aqueous solution

![UV-visible spectrum of KAuCl₄ aqueous solution](image)

**Fig. S1.** UV-visible spectrum of KAuCl₄ aqueous solution

The aqueous solution of KAuCl₄ (1 mg/mL) used in the layer-by-layer self-assembly is characterized with UV-visible spectrum, which shows a featured peak at 216.5 nm accompanied by a broad absorption at around 287 nm.

2. UV-visible spectra of KAuCl₄ aqueous solution and PDDA/KAuCl₄ mixed solution

UV-visible spectra were compared for KAuCl₄ aqueous solution and that mixed with PDDA aqueous solution with a mixing mole ratio of 1:1. As Fig. S2 displays, after mixing the PDDA/[AuCl₄]⁻ solution with a mole ratio of 1:1, the absorption at 287 nm disappears and the absorption at 216.5 nm shifts by 1 nm to 217.5 nm. This phenomenon assisted to prove the ligand-to-metal charge transfer occurred between PDDA and [AuCl₄]⁻. Note that PDDA aqueous solution showed on featured absorption peaks in the UV-visible range.
Fig. S2. UV-visible spectra of KAuCl₄ aqueous solution (black line) and PDDA/KAuCl₄ mixed solution (red line).