Supporting Information

Size-dependent stability toward dissociation and ligand binding energies of phosphine-ligated gold cluster ions

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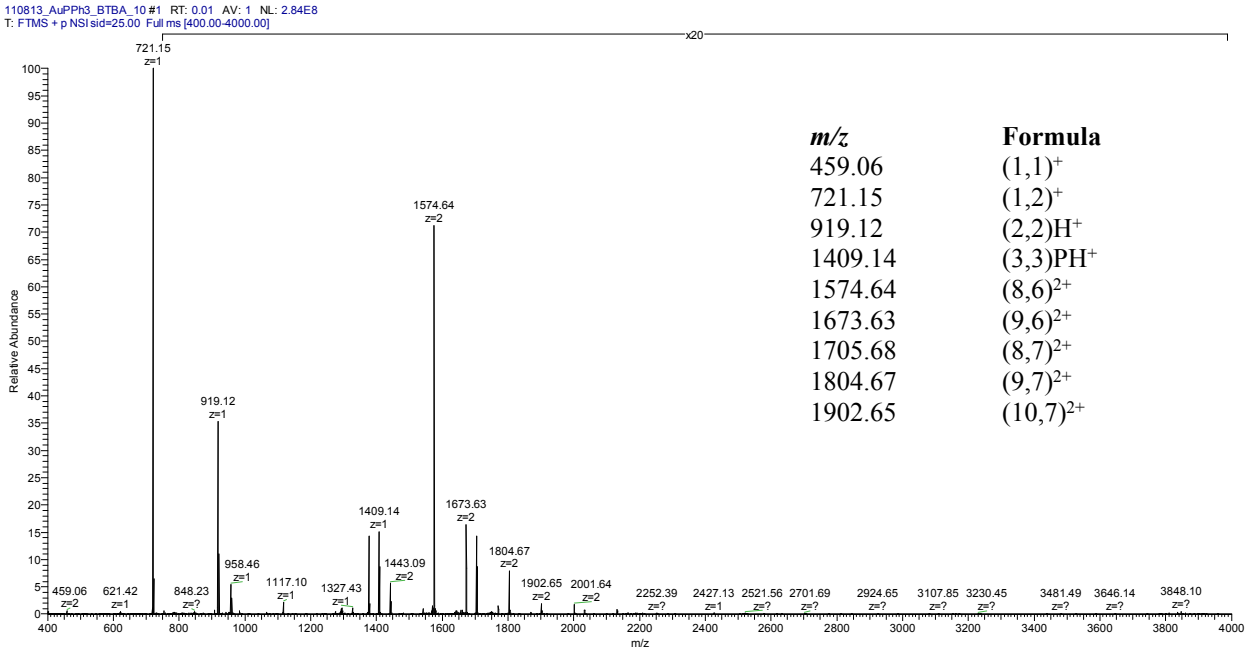


Figure S1. A typical positive mode ESI mass spectrum of subnanometer TPP-ligated gold clusters synthesized in methanol containing 0.2 μM borane *tert*-butylamine reducing agent.

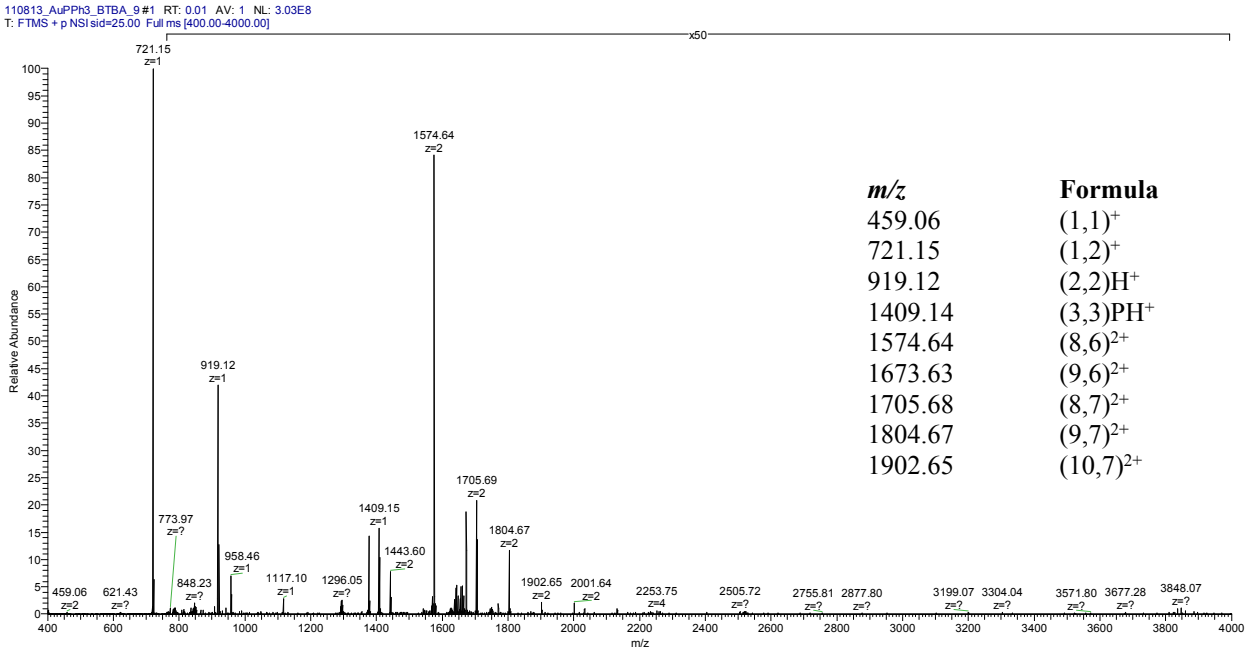
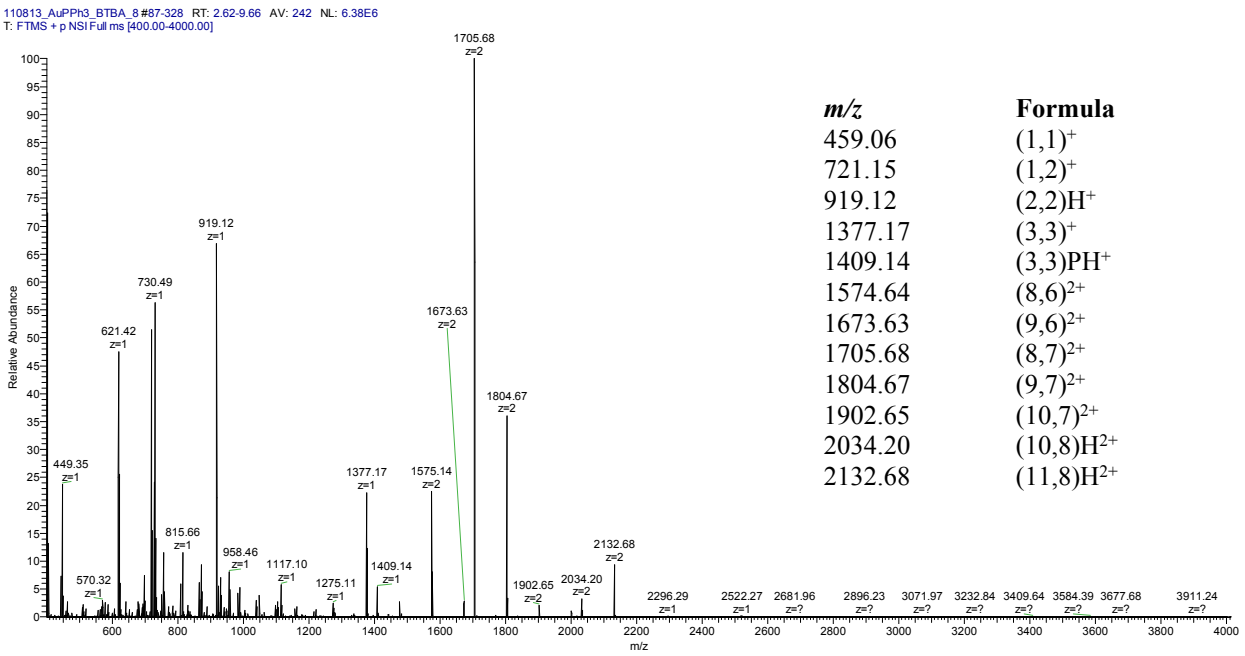


Figure S2. A typical positive mode ESI mass spectrum of subnanometer TPP-ligated gold clusters synthesized in methanol containing 0.5 μM borane *tert*-butylamine reducing agent.



m/z	**Formula**
459.06	$(1,1)^{+}$
721.15	$(1,2)^{+}$
919.12	$(2,2)H^{+}$
1377.17	$(3,3)^{+}$
1409.14	$(3,3)PH^{+}$
1574.64	$(8,6)^{2+}$
1673.63	$(9,6)^{2+}$
1705.68	$(8,7)^{2+}$
1804.67	$(9,7)^{2+}$
1902.65	$(10,7)^{2+}$
2034.20	$(10,8)H^{2+}$
2132.68	$(11,8)H^{2+}$

Figure S3. A typical positive mode ESI mass spectrum of subnanometer TPP-ligated gold clusters synthesized in methanol containing 1.0 μM borane *tert*-butylamine reducing agent.

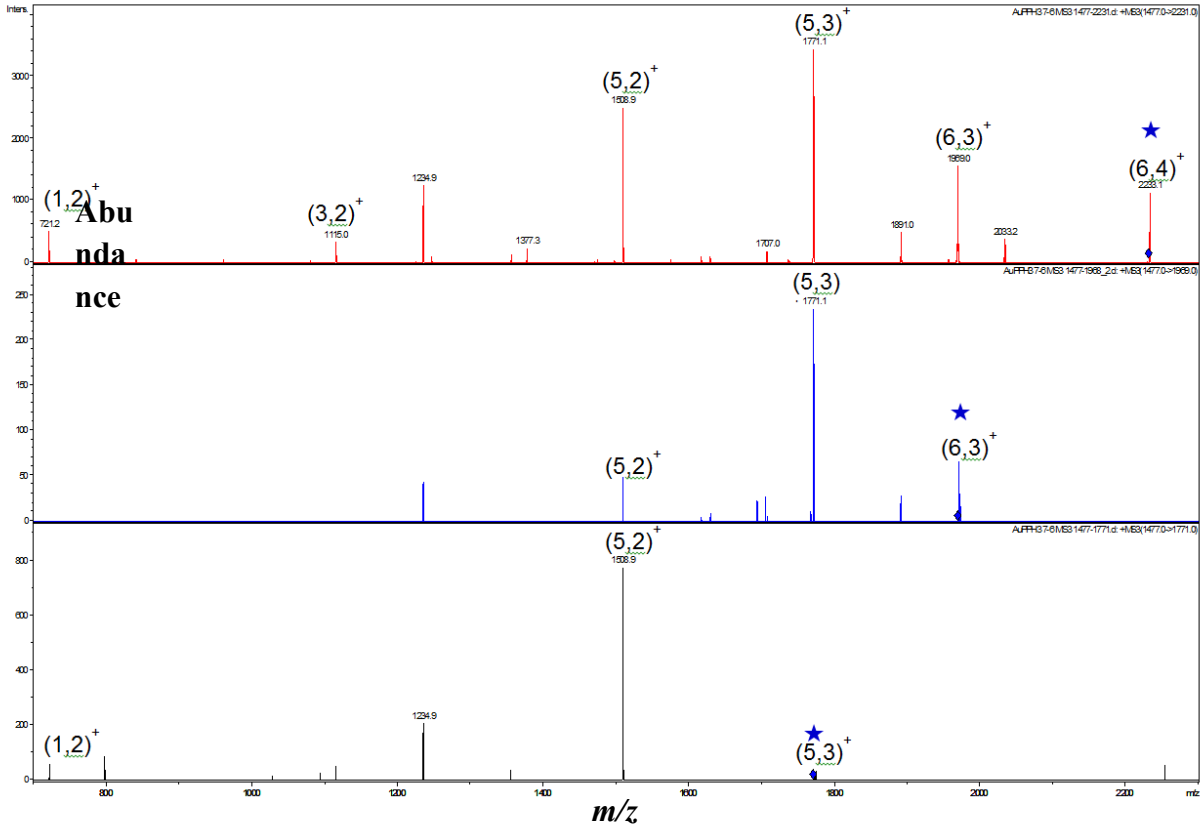


Figure S4. MS^3 spectra of $(6,4)^+$, $(6,3)^+$ and $(5,3)^+$ product ions generated from the $(7,6)^{2+}$ precursor ion. The ions selected for dissociation are marked with a blue star.

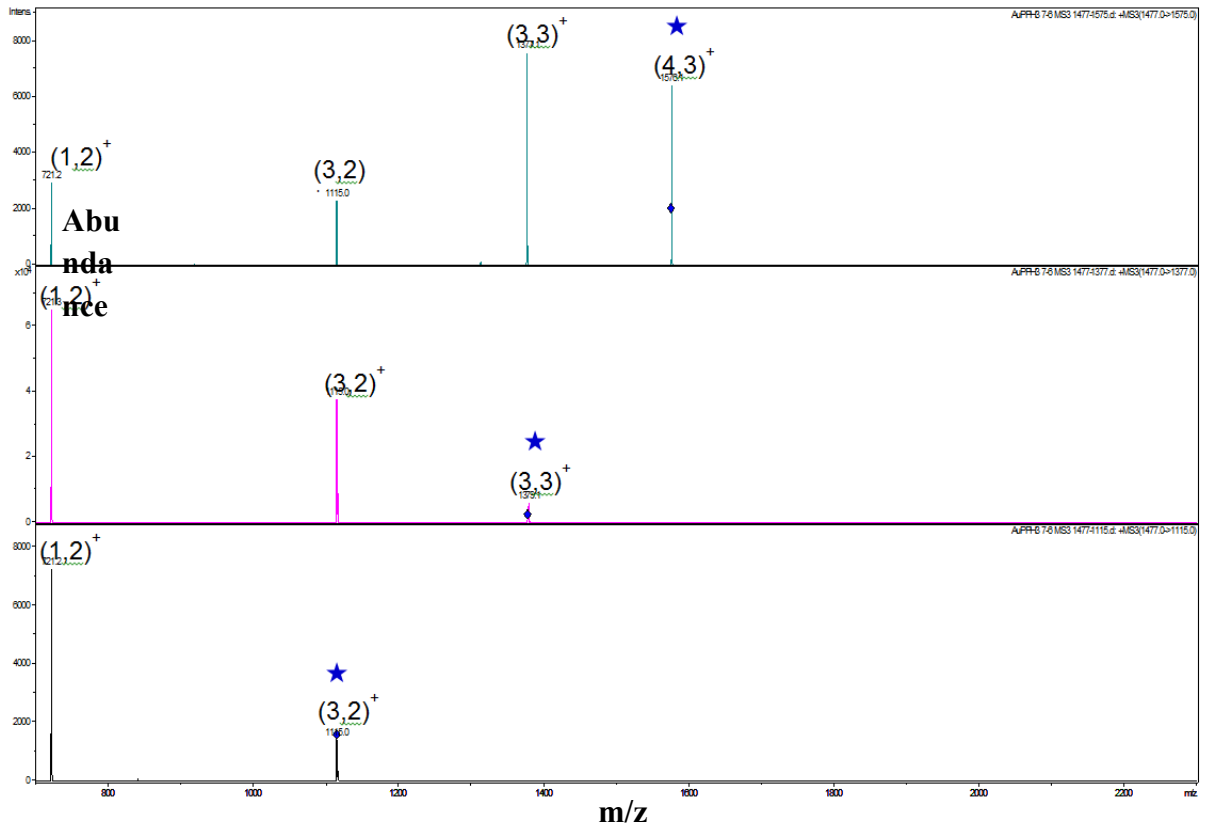
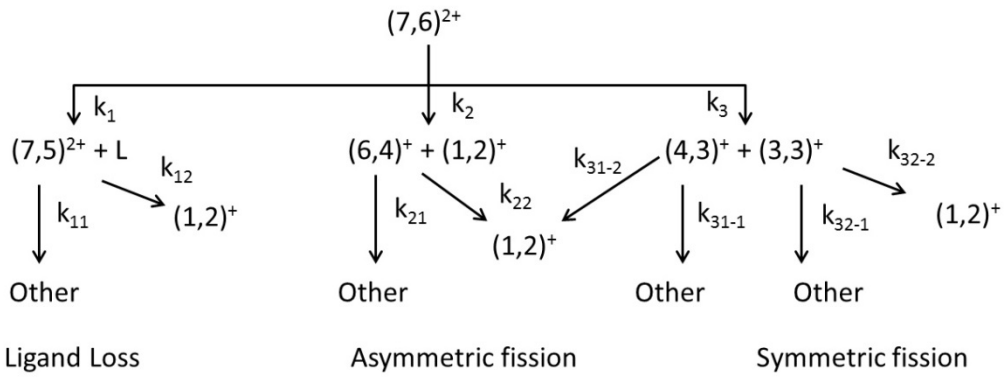
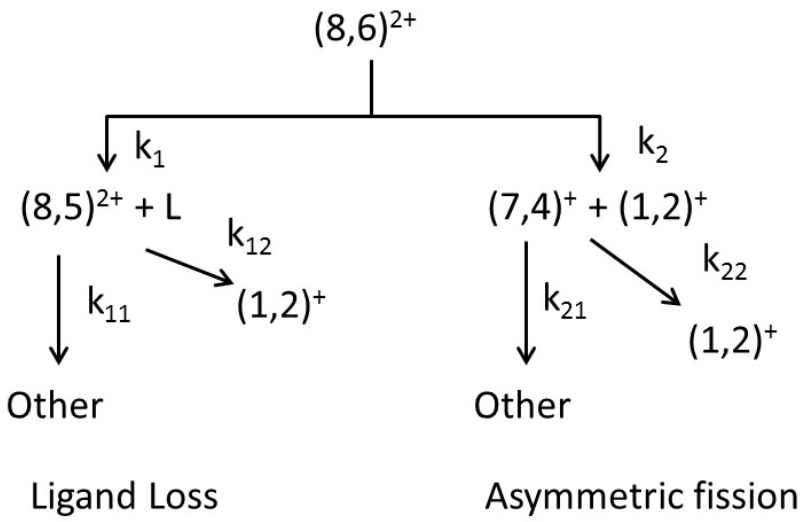


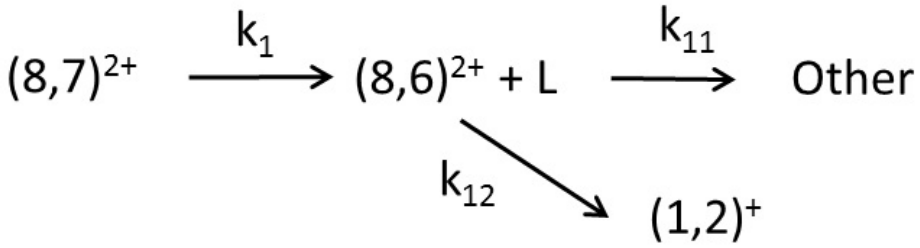
Figure S5. MS^3 spectra of $(4,3)^+$, $(3,3)^+$ and $(3,2)^+$ product ions generated from the $(7,6)^{2+}$ precursor ion. The ions selected for dissociation are marked with a blue star.



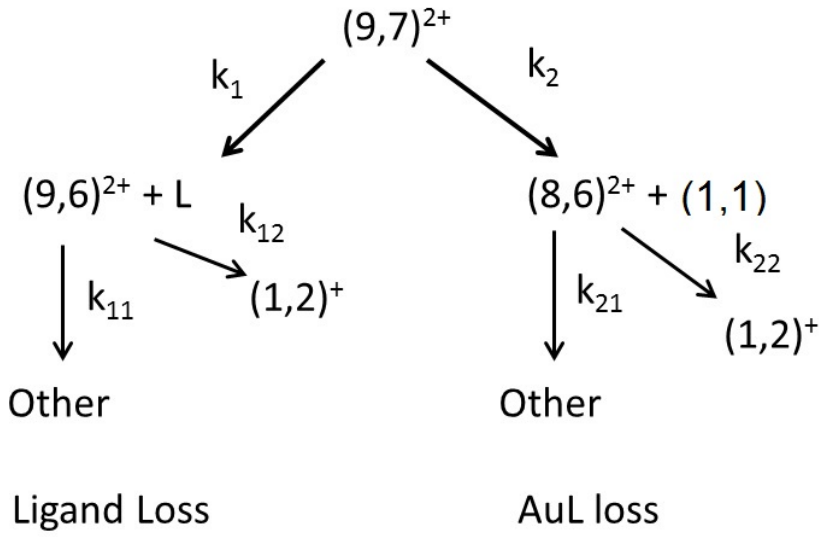
Scheme 1. Simplified kinetic scheme used for RRKM modeling of $(7,6)^{2+}$.



Scheme 2. Simplified kinetic scheme used for RRKM modeling of $(8,6)^{2+}$.



Scheme 3. Simplified kinetic scheme used for RRKM modeling of $(8,7)^{2+}$.



Scheme 4. Simplified kinetic scheme used for RRKM modeling of $(9,7)^{2+}$.