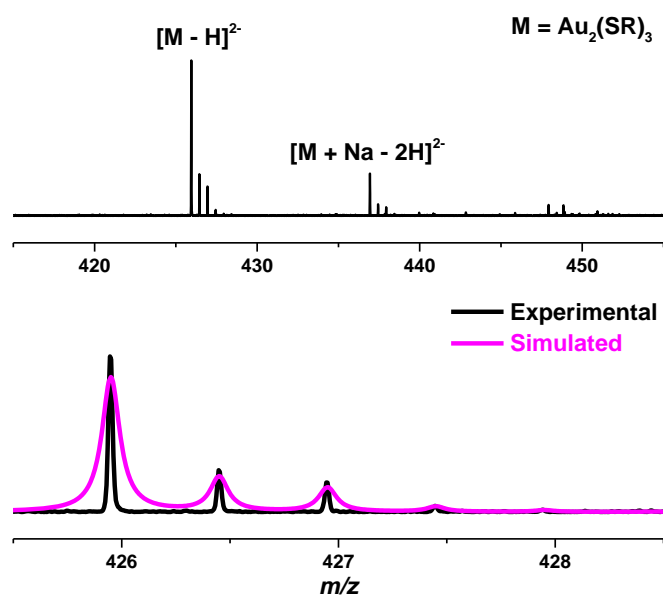
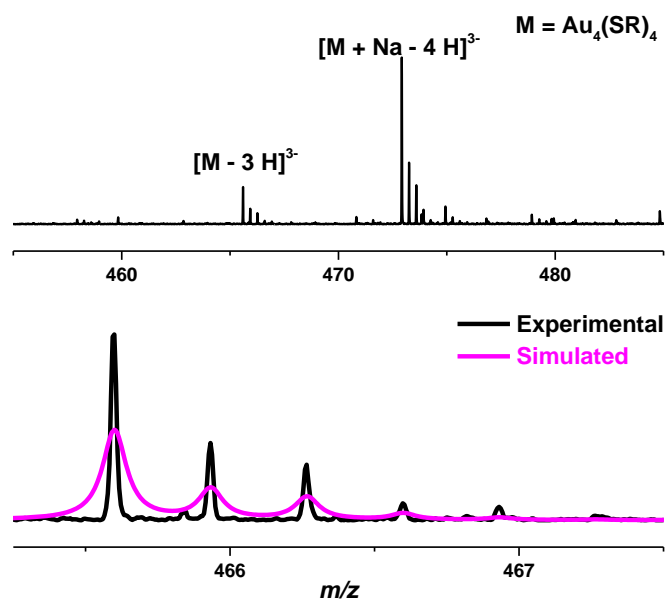


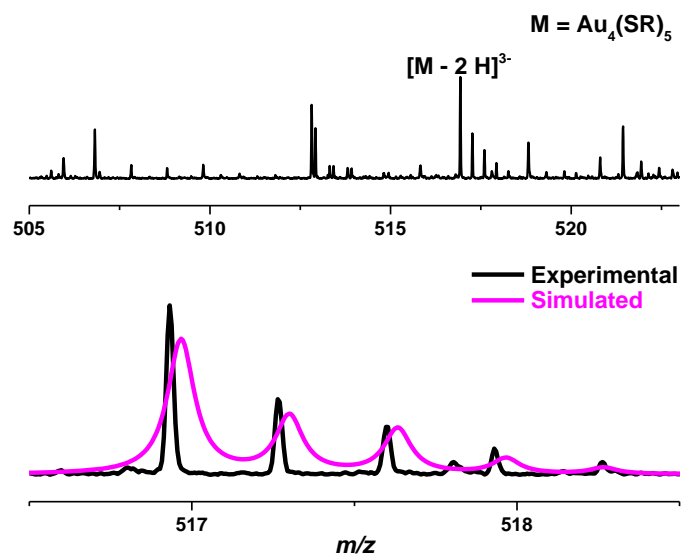
Supplementary Figure 1. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}(\text{SR})_2]^-$ (species **1**) obtained from 0 min sample.



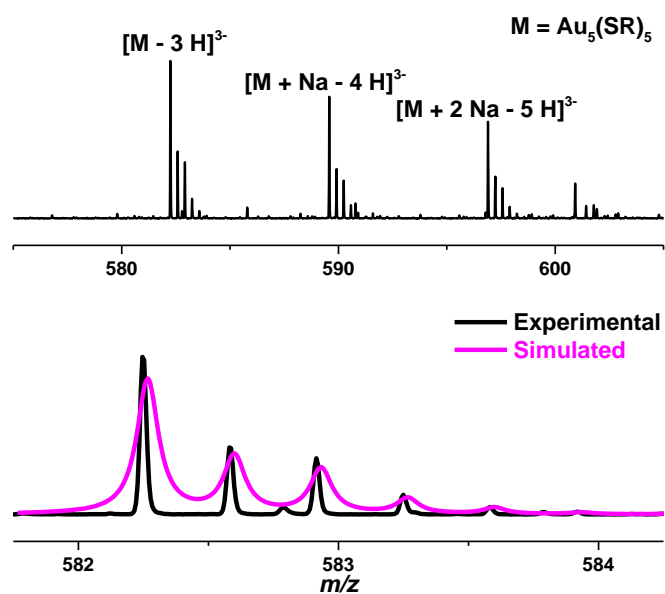
Supplementary Figure 2. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_2(SR)_3 - H]^{2-}$ (species **2**) obtained from 0 min sample.



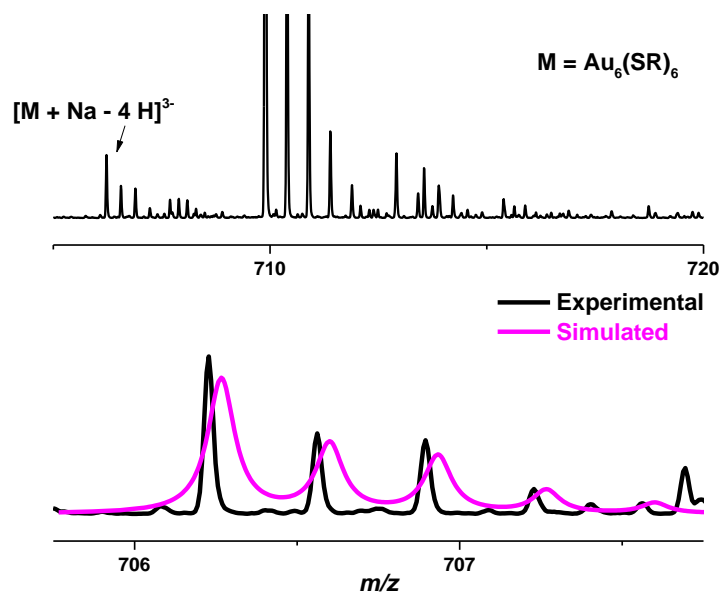
Supplementary Figure 3. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_4(SR)_4 - 3 H]^{3-}$ (species **3**) obtained from 0 min sample.



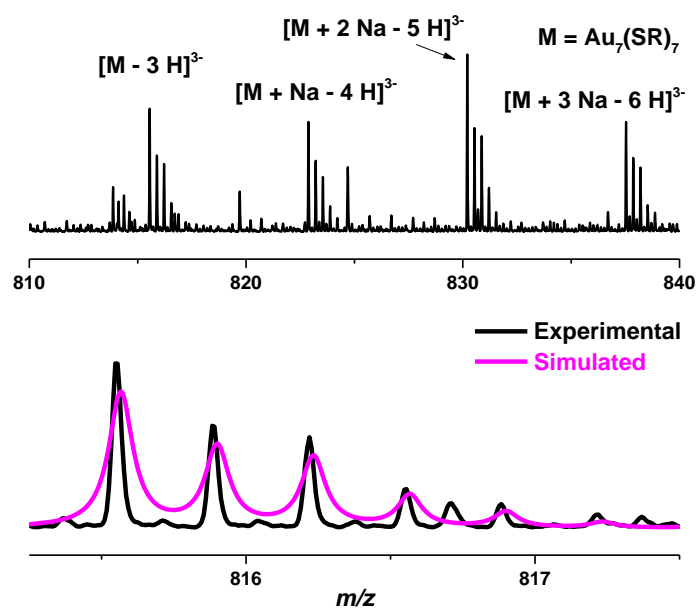
Supplementary Figure 4. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_4(SR)_5 - 2 H]^{3-}$ (species **4**) obtained from 0 min sample.



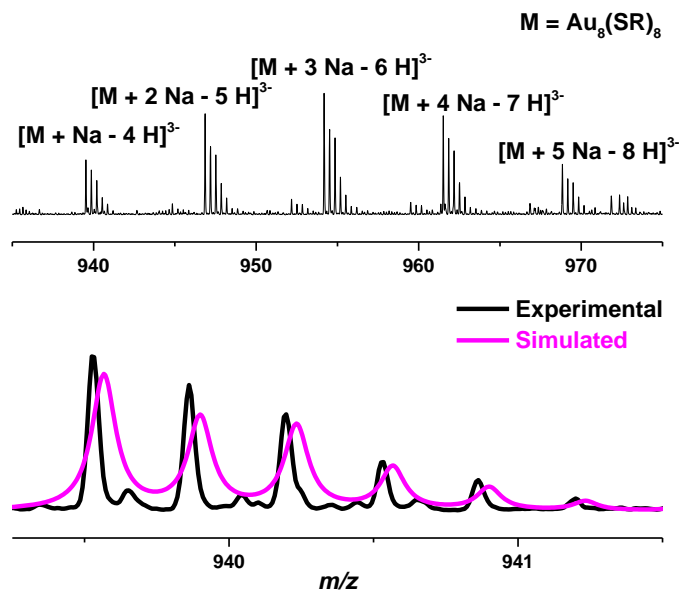
Supplementary Figure 5. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_5(SR)_5 - 3 H]^{3-}$ (species **5**) obtained from 0 min sample.



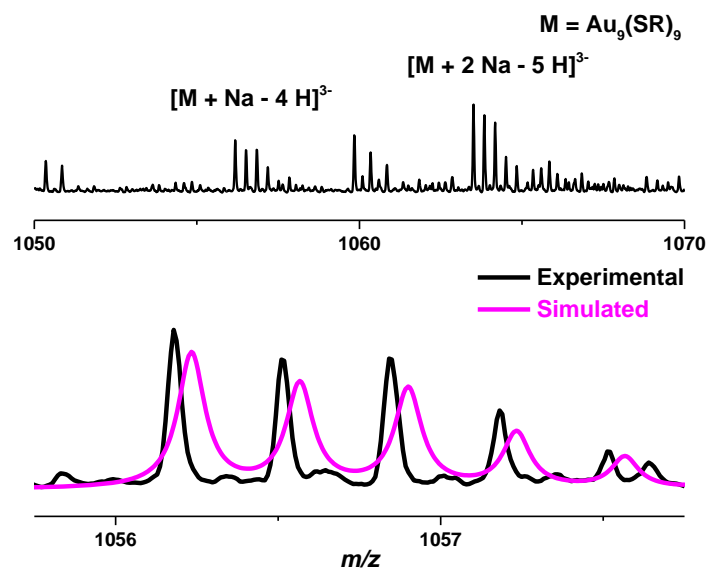
Supplementary Figure 6. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_6(\text{SR})_6 + \text{Na} - 4 \text{H}]^{3-}$ (species **6**) obtained from 0 min sample.



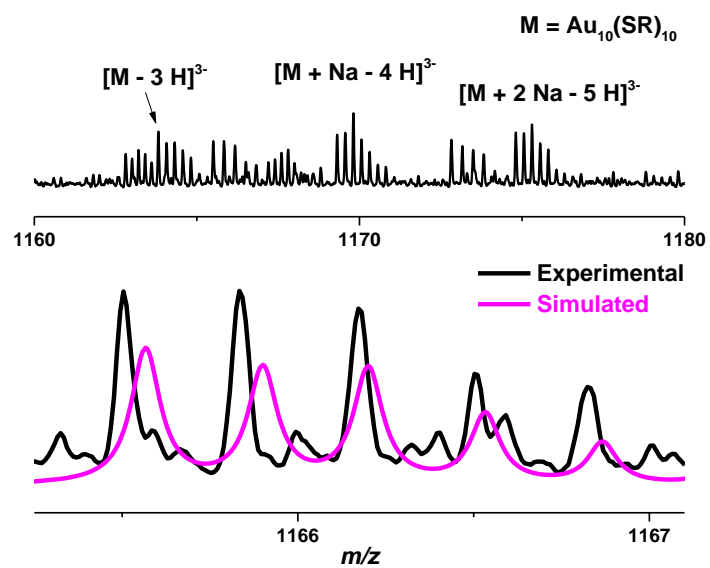
Supplementary Figure 7. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_7(SR)_7 - 3 H]^{3-}$ (species **7**) obtained from 0 min sample.



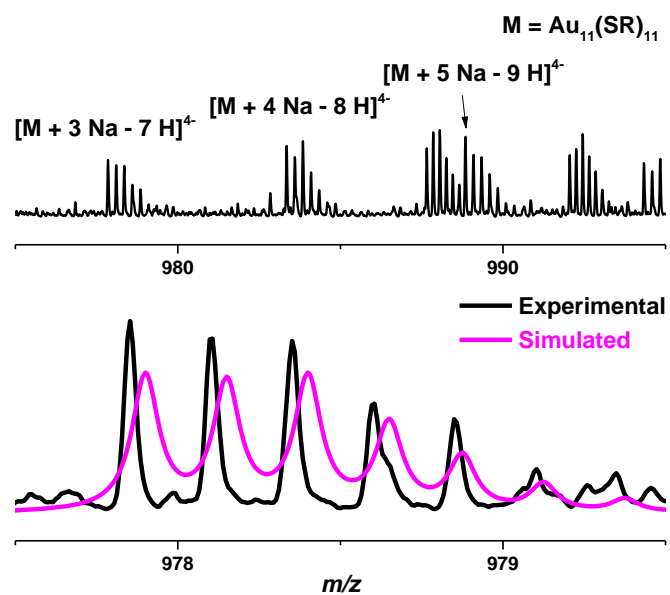
Supplementary Figure 8. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_8(\text{SR})_8 + \text{Na} - 4 \text{H}]^{3-}$ (species **8**) obtained from 0 min sample.



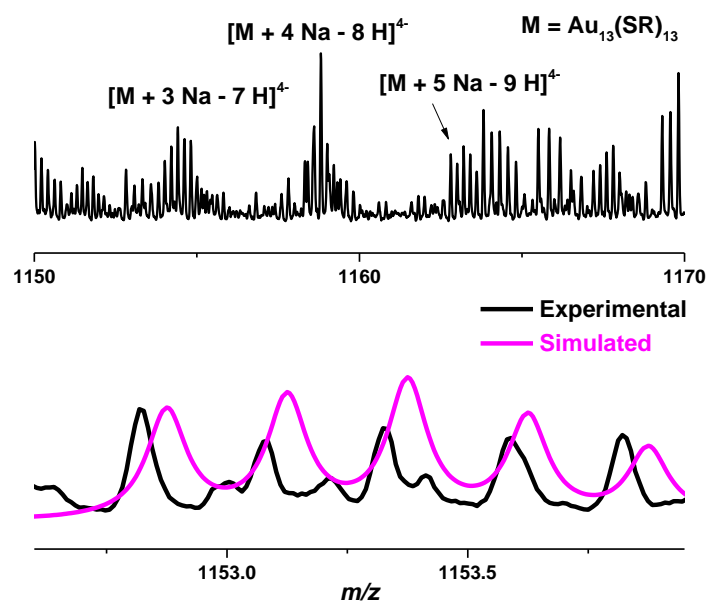
Supplementary Figure 9. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_9(SR)_9 + Na - 4 H]^{3-}$ (species 9) obtained from 0 min sample.



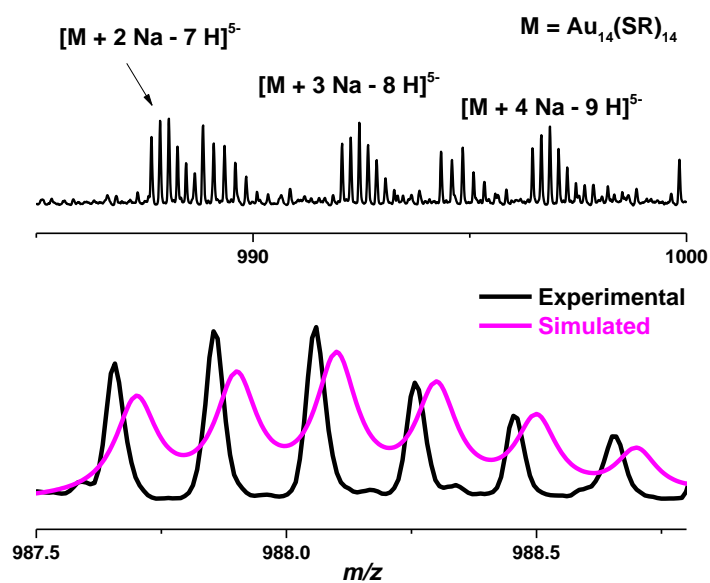
Supplementary Figure 10. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_{10}(SR)_{10} - 3 H]^{3-}$ (species **10**) obtained from 0 min sample.



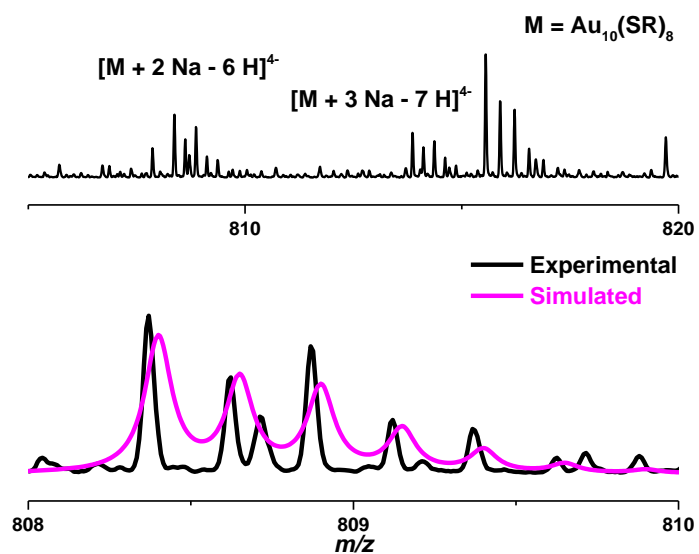
Supplementary Figure 11. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_{11}(SR)_{11} + 3 Na - 7 H]^{4-}$ (species **11**) obtained from 0 min sample.



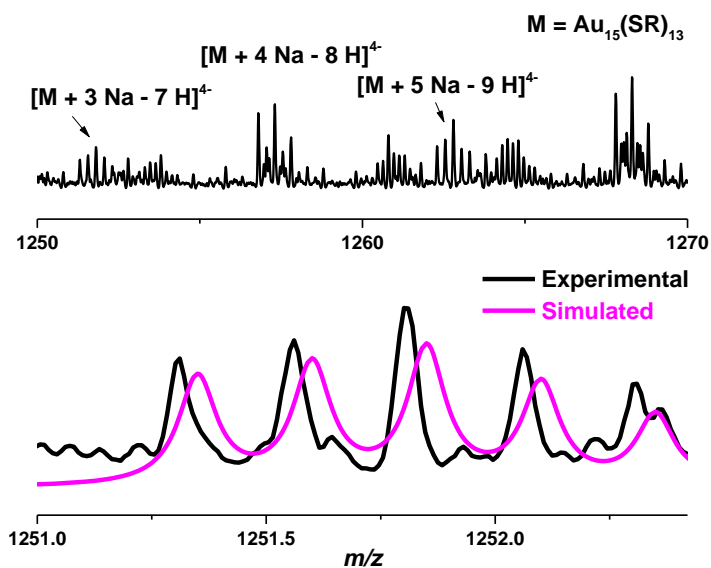
Supplementary Figure 12. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{13}(\text{SR})_{13} + 3 \text{Na} - 7 \text{H}]^{4-}$ (species **12**) obtained from 0 min sample.



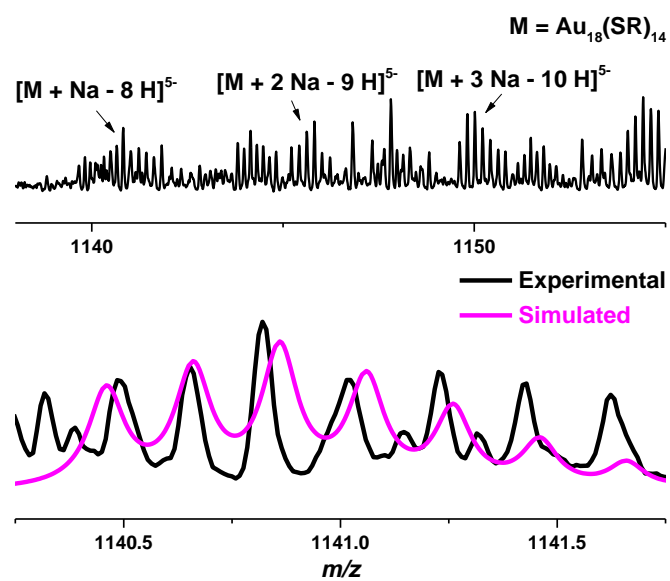
Supplementary Figure 13. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{14}(\text{SR})_{14} + 2 \text{Na} - 7 \text{H}]^{5-}$ (species **13**) obtained from 0 min sample.



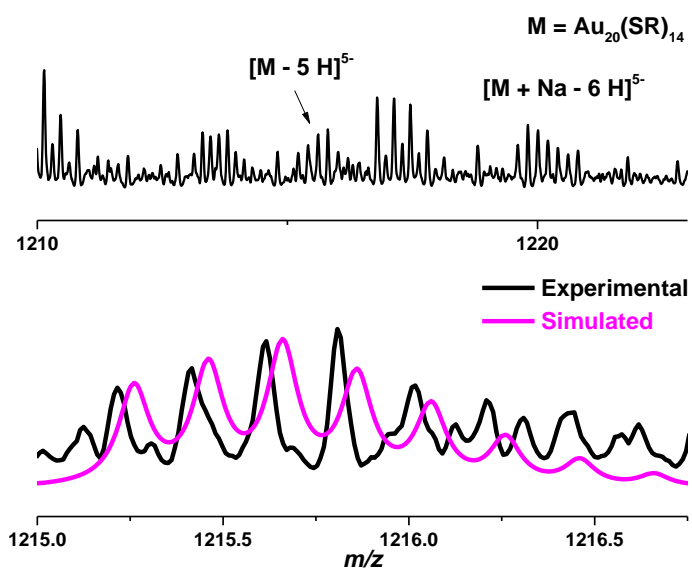
Supplementary Figure 14. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{10}(\text{SR})_8 + 2 \text{ Na} - 6 \text{ H}]^{4+}$ (species **14**) obtained from 0 min sample.



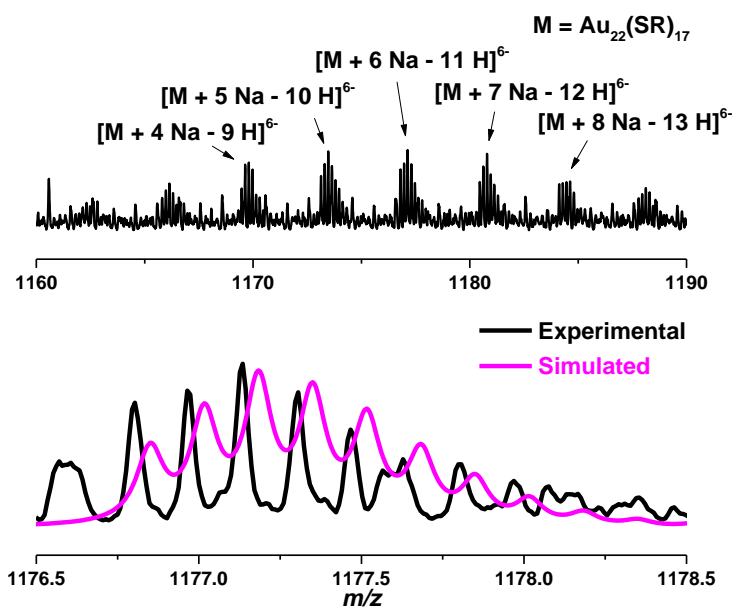
Supplementary Figure 15. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{15}(\text{SR})_{13} + 3 \text{ Na} - 7 \text{ H}]^{4+}$ (species **15**) obtained from 0 min sample.



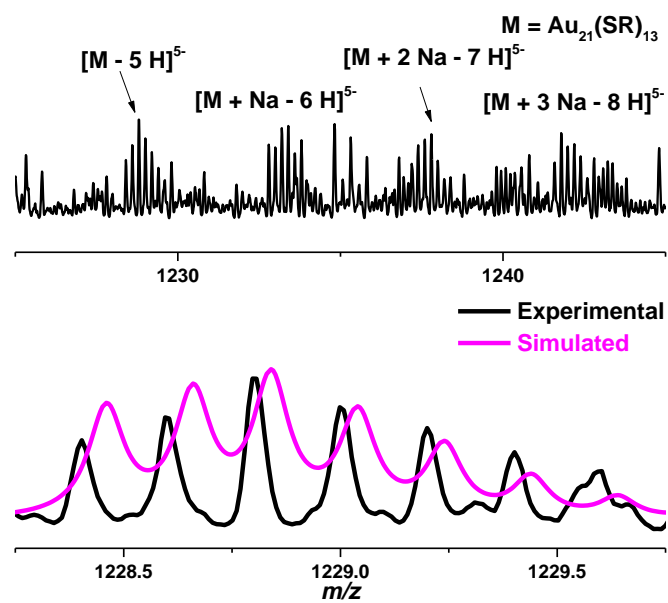
Supplementary Figure 16. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{18}(\text{SR})_{14} + \text{Na} - 8 \text{H}]^{5-}$ (species **16**) obtained from 0 min sample.



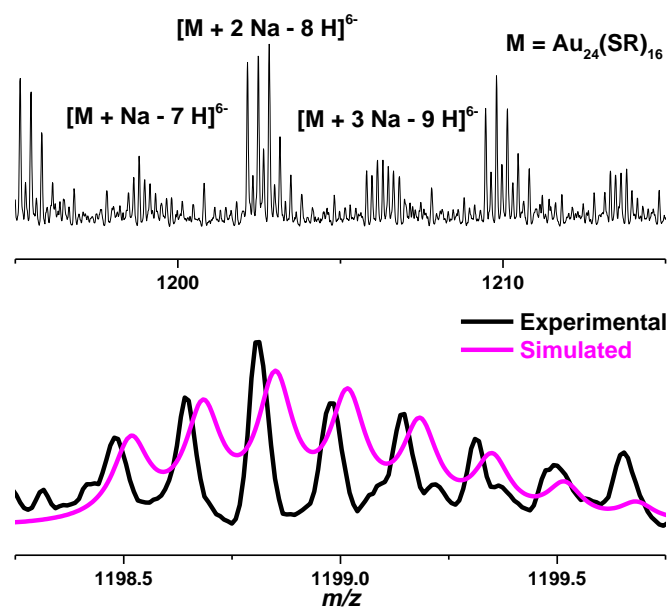
Supplementary Figure 17. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_{20}(SR)_{14} - 5 H]^{5-}$ (species **17**) obtained from 0 min sample.



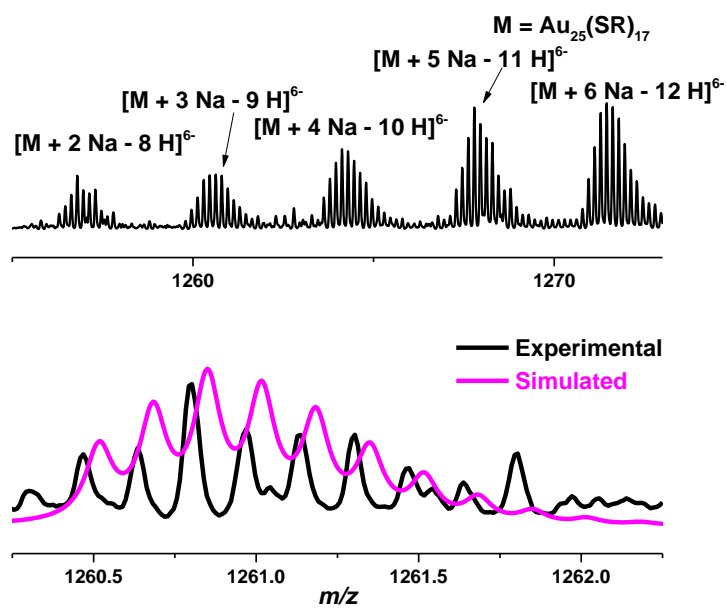
Supplementary Figure 18. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{22}(\text{SR})_{17} + 6 \text{ Na} - 11 \text{ H}]^{6-}$ (species **18**) obtained from 0 min sample.



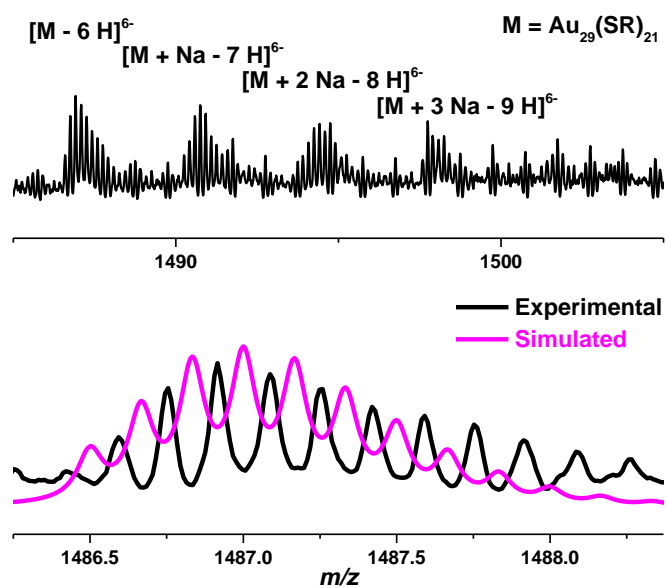
Supplementary Figure 19. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_{21}(SR)_{13} - 5 H]^{5-}$ (species **19**) obtained from 0 min sample.



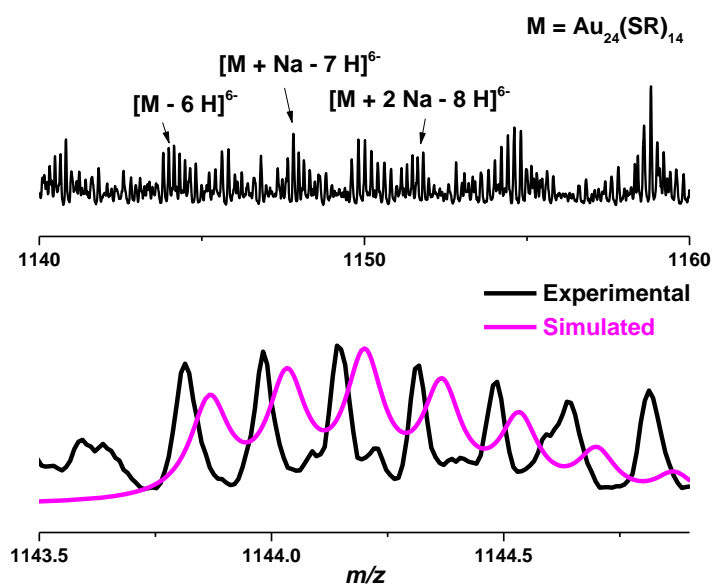
Supplementary Figure 20. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{24}(\text{SR})_{16} + \text{Na} - 7 \text{ H}]^{6-}$ (species **20**) obtained from 0 min sample.



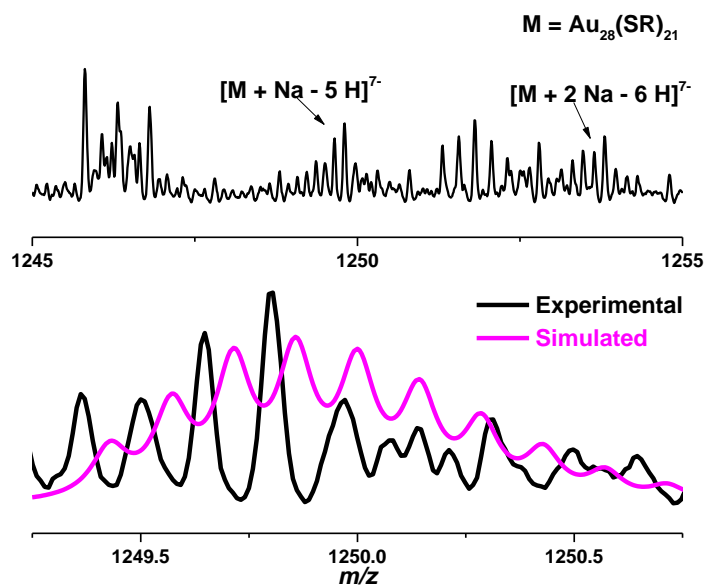
Supplementary Figure 21. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{25}(\text{SR})_{17} + 2 \text{ Na} - 8 \text{ H}]^{6-}$ (species **21**) obtained from 10 min sample.



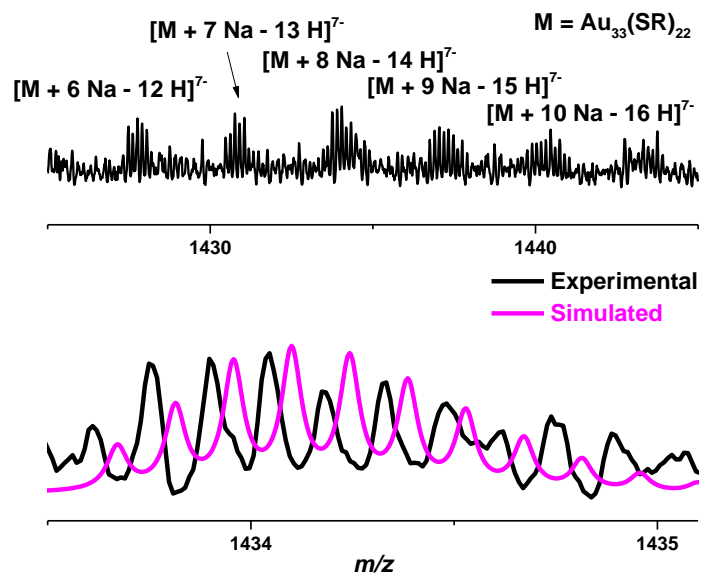
Supplementary Figure 22. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_{29}(SR)_{21} - 6 H]^{6-}$ (species **23**) obtained from 10 min sample.



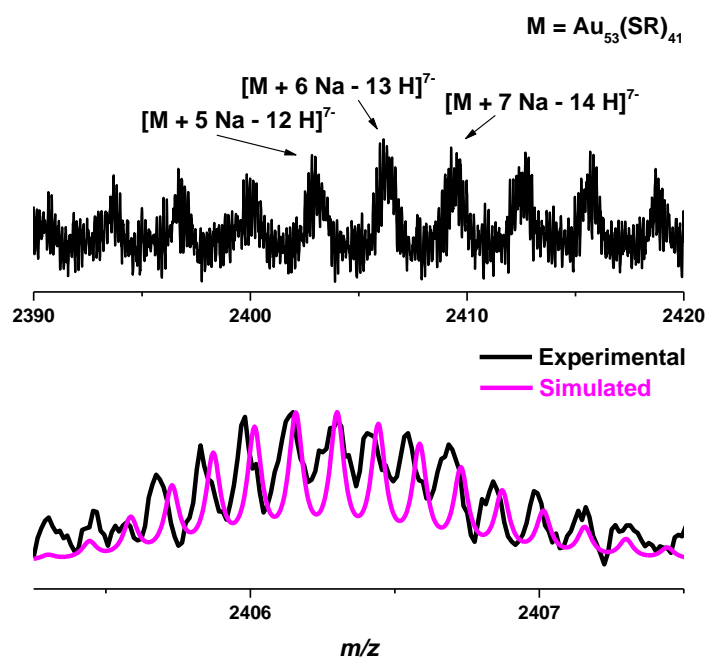
Supplementary Figure 23. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_{24}(SR)_{14} - 6 H]^{6-}$ (species **24**) obtained from 10 min sample.



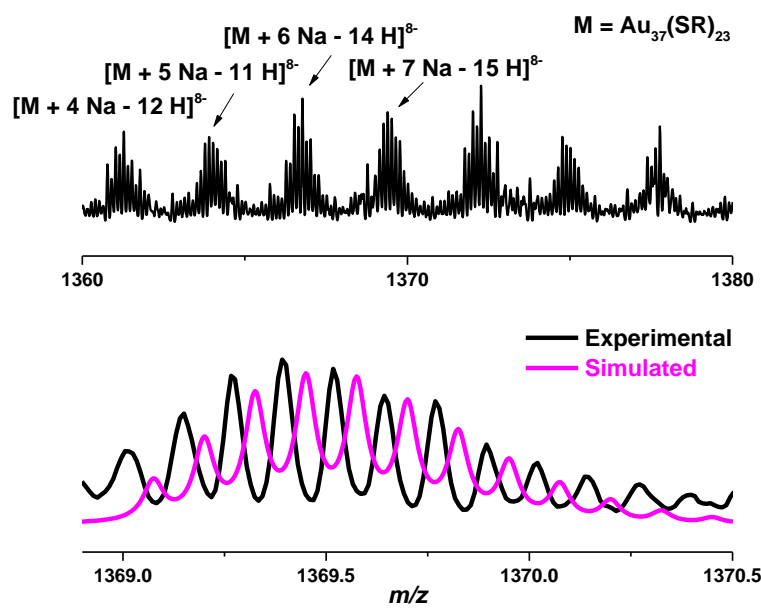
Supplementary Figure 24. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[Au_{28}(SR)_{21} + Na - 5 H]^{7-}$ (species **25**) obtained from 10 min sample.



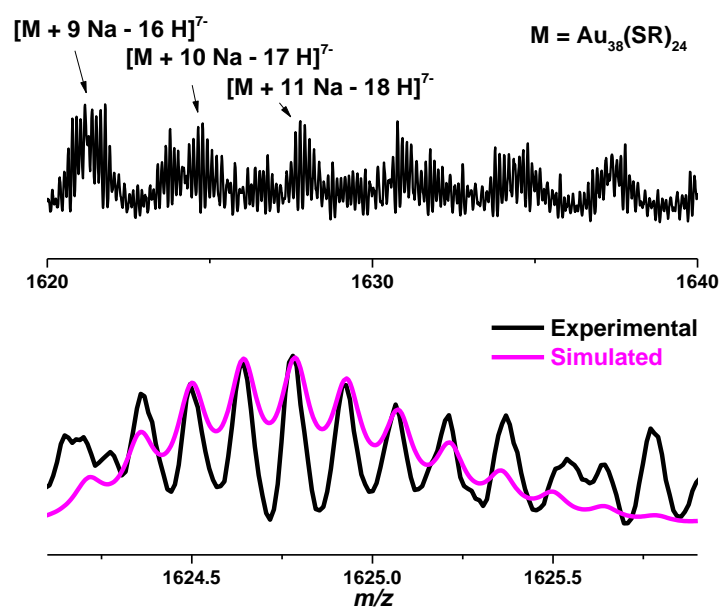
Supplementary Figure 25. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{33}(\text{SR})_{22} + 8 \text{ Na} - 14 \text{ H}]^{7-}$ (species **26**) obtained from 1 h sample.



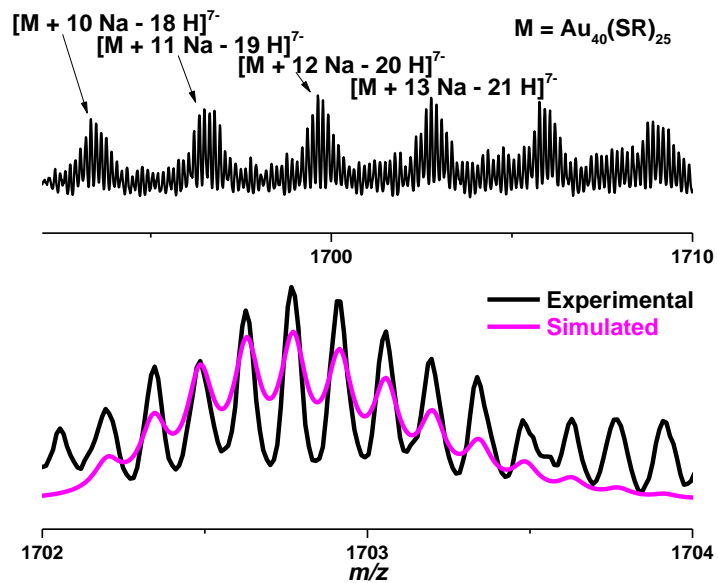
Supplementary Figure 26. Electrospray ionization mass spectrum (top) and isotopic patterns (bottom) of $[\text{Au}_{53}(\text{SR})_{41} + 6 \text{ Na} - 13 \text{ H}]^{7-}$ (species **27**) obtained from 24 h sample.



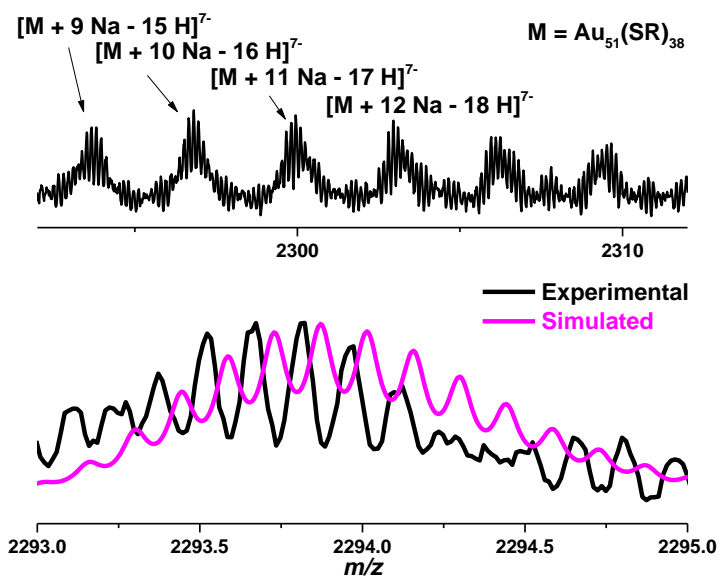
Supplementary Figure 27. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{37}(\text{SR})_{23} + 7 \text{ Na} - 15 \text{ H}]^{8-}$ (species **28**) obtained from 10 min sample.



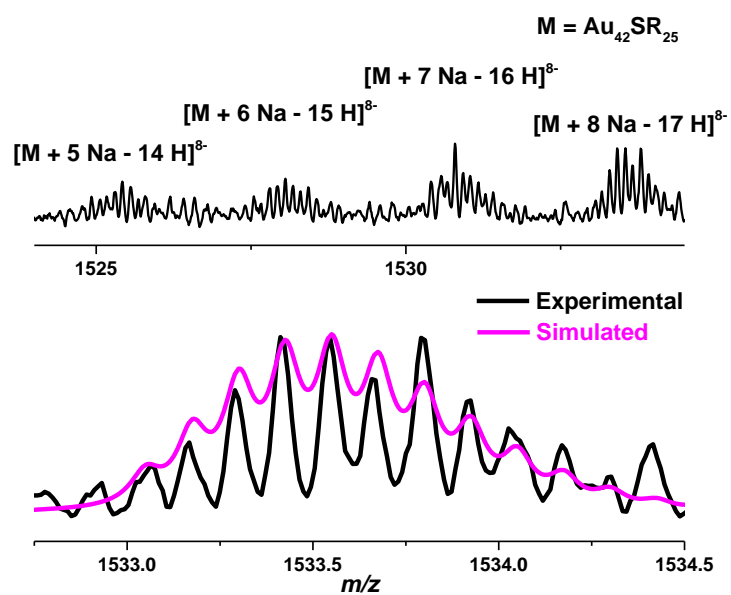
Supplementary Figure 28. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{38}(\text{SR})_{24} + 10 \text{ Na} - 17 \text{ H}]^{7-}$ (species **29**) obtained from 4 h sample.



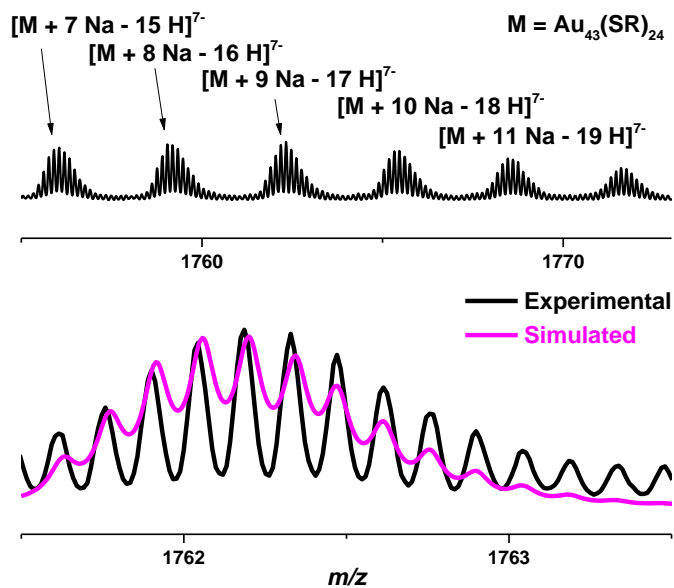
Supplementary Figure 29. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{40}(\text{SR})_{25} + 10 \text{ Na} - 18 \text{ H}]^{7-}$ (species **30**) obtained from 10 h sample.



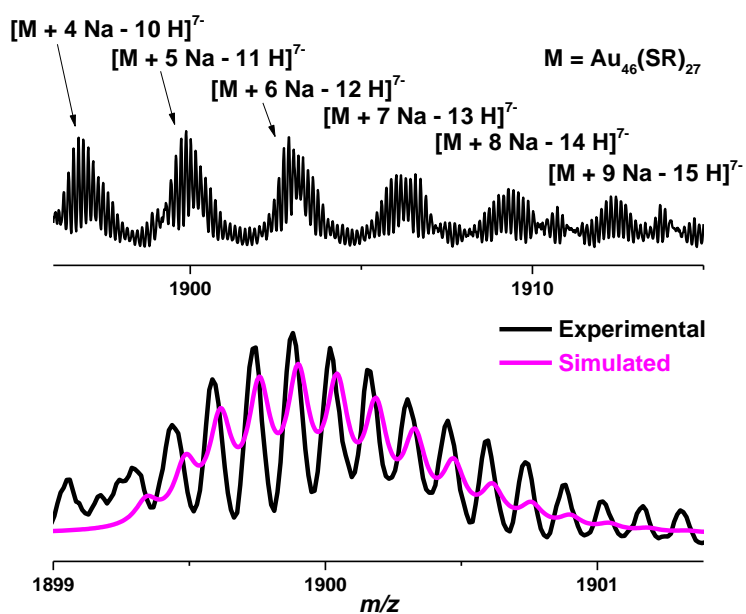
Supplementary Figure 30. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{51}(\text{SR})_{38} + 9 \text{ Na} - 15 \text{ H}]^{7-}$ (species **31**) obtained from 12 h sample.



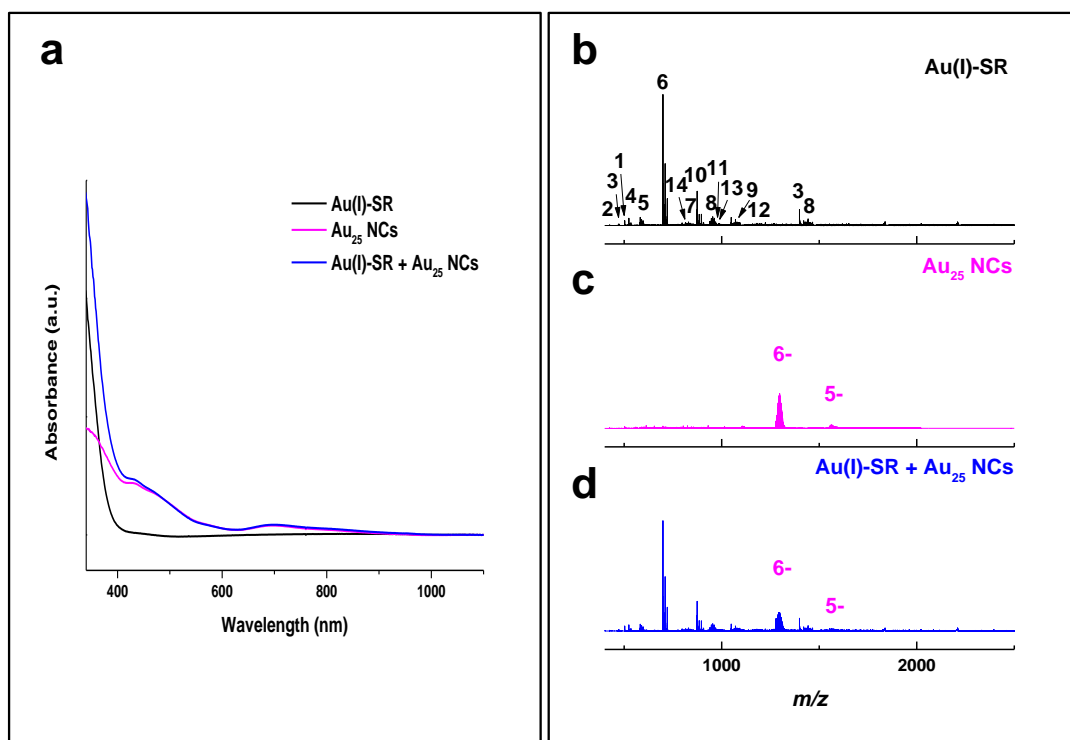
Supplementary Figure 31. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{42}(\text{SR})_{25} + 8 \text{ Na} - 17 \text{ H}]^{8-}$ (species **32**) obtained from 12 h sample.



Supplementary Figure 32. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{43}(\text{SR})_{24} + 9 \text{ Na} - 17 \text{ H}]^{7-}$ (species **33**) obtained from 12 h sample.



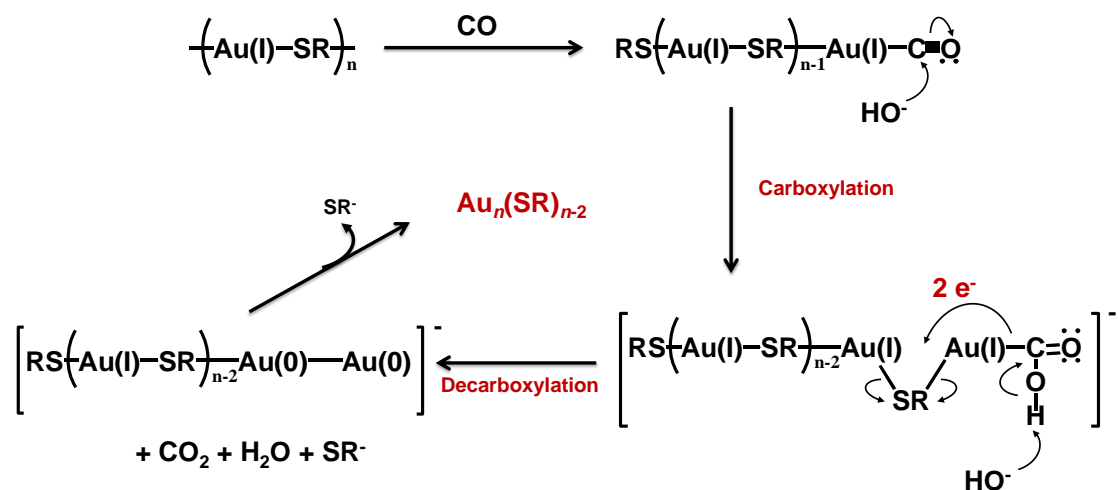
Supplementary Figure 33. Electrospray ionization mass spectrum (top) and isotope patterns (bottom) of $[\text{Au}_{46}(\text{SR})_{27} + 5 \text{ Na} - 11 \text{ H}]^{7-}$ (species **35**) obtained from 12 h sample.



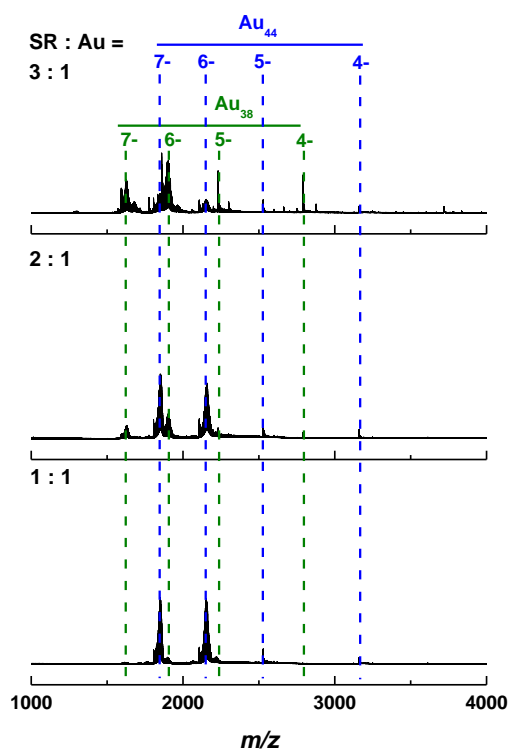
Supplementary Figure 34. (a) Ultraviolet-visible absorption and (b-d) electropray ionization mass spectra of (b) Au(I)-SR complexes, (c) $[\text{Au}_{25}(\text{SR})_{18}]^-$ and (d) their mixture. The Au(I)-SR complex species identified in the mass spectra are listed in Supplementary Table 1.

Supplementary Table 1. Au(I)-SR complex species identified in Supplementary Figure 34b

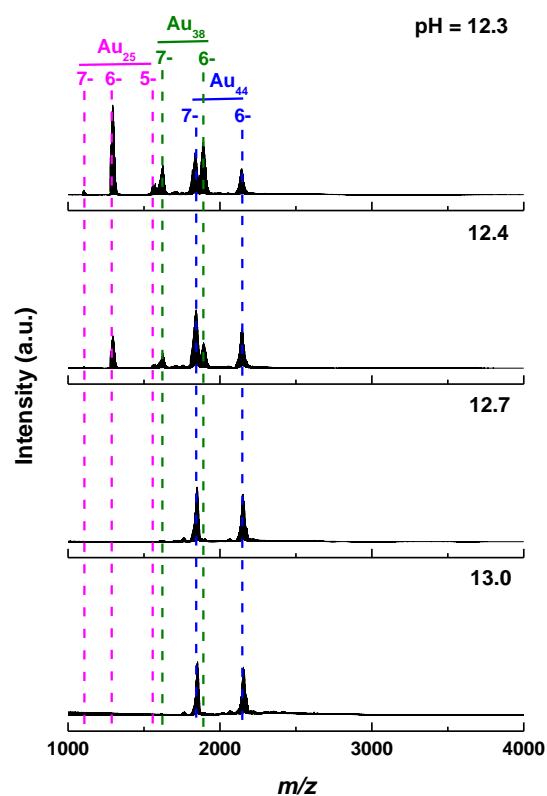
Au(I)-SR Complex Species							
1	$[\text{Au}(\text{SR})_2]^-$	5	$[\text{Au}_5(\text{SR})_5]^0$	9	$[\text{Au}_9(\text{SR})_9]^0$	13	$[\text{Au}_{14}(\text{SR})_{14}]^0$
2	$[\text{Au}_2(\text{SR})_3]^-$	6	$[\text{Au}_6(\text{SR})_6]^0$	10	$[\text{Au}_{10}(\text{SR})_{10}]^0$		
3	$[\text{Au}_4(\text{SR})_4]^0$	7	$[\text{Au}_7(\text{SR})_7]^0$	11	$[\text{Au}_{11}(\text{SR})_{11}]^0$		
4	$[\text{Au}_4(\text{SR})_5]^-$	8	$[\text{Au}_8(\text{SR})_8]^0$	12	$[\text{Au}_{13}(\text{SR})_{13}]^0$		



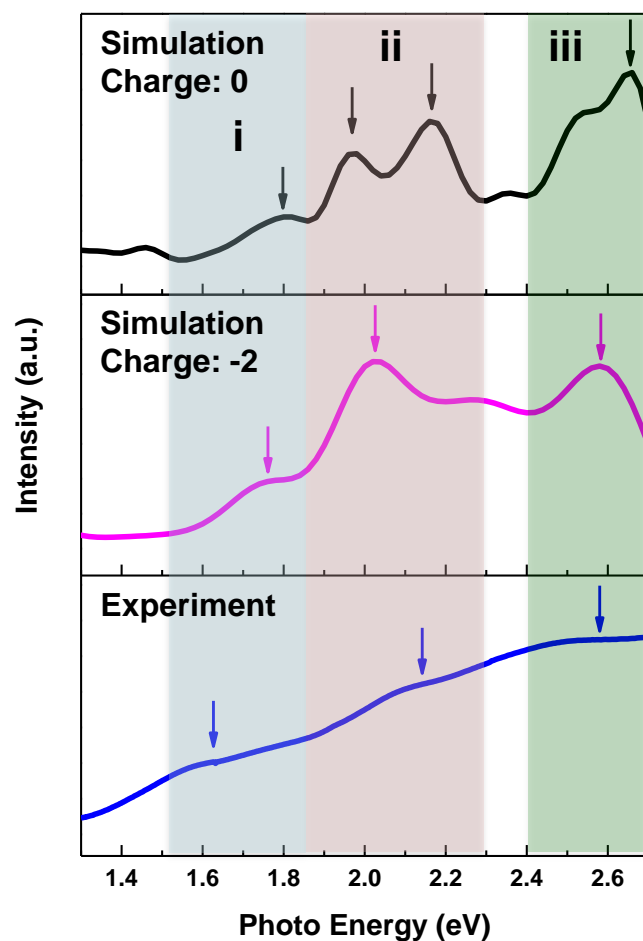
Supplementary Figure 35. Schematic illustration of carboxylation-decarboxylation assisted reduction of Au(I)-SR complexes (exemplified by $[\text{Au}_n(\text{SR})_n]^0$ species).



Supplementary Figure 36. Electrospray ionization mass spectra of NC species synthesized with Au(I)-SR complexes formed at varied SR-to-Au ratios. Reaction pH is 13.0. The dotted lines are visual guides for cluster ions of $[\text{Au}_{38}(\text{SR})_{24}]^0$ (olive lines) and $[\text{Au}_{44}(\text{SR})_{26}]^{2-}$ (blue lines) carrying varied charges.



Supplementary Figure 37. Electrospray ionization mass spectra of NC species synthesized at varied pH values. The SR-to-Au ratio used in the synthesis is 1:1. The dotted lines are visual guides for cluster ions of $[\text{Au}_{25}(\text{SR})_{18}]^-$ (magenta lines), $[\text{Au}_{38}(\text{SR})_{24}]^0$ (olive lines), and $[\text{Au}_{44}(\text{SR})_{26}]^{2-}$ (blue lines) carrying varied charges.

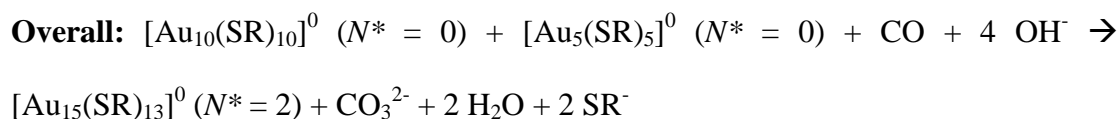
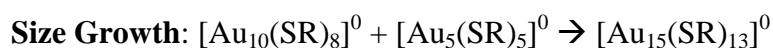
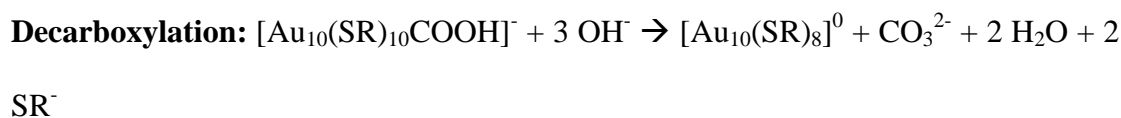
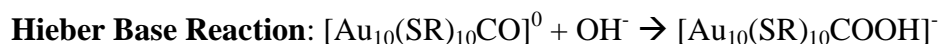
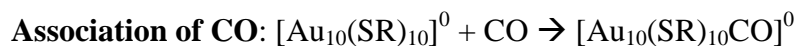


Supplementary Figure 38. Simulated optical absorption spectra of $[\text{Au}_{44}(\text{SR})_{26}]^q$ for $q = 0$ (neutral) and -2 (dianion), in comparison with the experimental spectrum of $[\text{Au}_{44}(\text{SR})_{26}]^{2-}$. Simulation was done at the TDDFT-B3LYP/def2-SV(P) level for $[\text{Au}_{44}(\text{SCH}_3)_{26}]^q$. The main absorption peaks are highlighted in regions i, ii and iii, respectively, for easy comparison.

Supplementary Notes for Stage 0

The formation of $[\text{Au}_{25}(\text{SR})_{18}]^-$ was based on a reduction-growth mechanism detailed in our previous publication¹. The reaction was initiated by CO-reduction of reactive Au(I)-SR complex/NC species via a carboxylation-decarboxylation process. We first exemplified the reduction-growth mechanism by the formation of $[\text{Au}_{15}(\text{SR})_{13}]^0$ ($N^* = 2$) by CO-reduction of $[\text{Au}_{10}(\text{SR})_{10}]^0$ ($N^* = 0$). As shown in Supplementary Note 1, $[\text{Au}_{10}(\text{SR})_{10}]^0$ would first associate with a CO to form $[\text{Au}_{10}(\text{SR})_{10}\text{CO}]^0$ adduct, which could be converted to $[\text{Au}_{10}(\text{SR})_{10}\text{COOH}]^-$ via a typical Hieber base reaction at alkaline condition (pH = 13.0). Decarboxylation of such adduct then transfers $2 e^-$ to neighbored Au(I) centers and simultaneously releases two free SR ligands, giving rise to $[\text{Au}_{10}(\text{SR})_8]^0$ which contains two Au(0) centers. A plausible reaction pathway for such carboxylation-decarboxylation process can be seen in Supplementary Fig. 35. The as-formed $[\text{Au}_{10}(\text{SR})_8]^0$ ($N^* = 2$) could then associate with a $[\text{Au}_5(\text{SR})_5]^0$ to form a stable $2 e^-$ species $[\text{Au}_{15}(\text{SR})_{13}]^0$. The as-formed $2 e^-$ NC species (e.g., $[\text{Au}_{15}(\text{SR})_{13}]^0$) could further grow into NC species with higher N^* values (e.g., $N^* = 4 \rightarrow 6 \rightarrow 8 \rightarrow 10$) via a similar carboxylation-decarboxylation mechanism. For example, $[\text{Au}_{15}(\text{SR})_{13}]^0$ ($N^* = 2$) could form $[\text{Au}_{20}(\text{SR})_{16}]^0$ ($N^* = 4$) by reacting with a CO and a $[\text{Au}_5(\text{SR})_5]^0$. $[\text{Au}_{20}(\text{SR})_{16}]^0$ could then be further reduced by one equiv. CO to give rise to a stable $6 e^-$ NC, $[\text{Au}_{20}(\text{SR})_{14}]^0$ ($N^* = 6$).

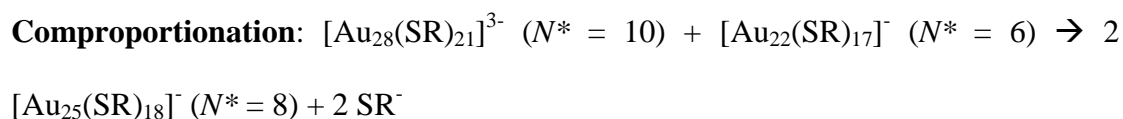
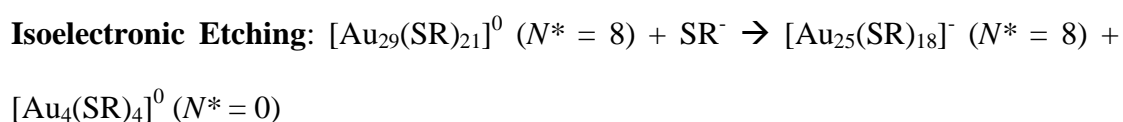
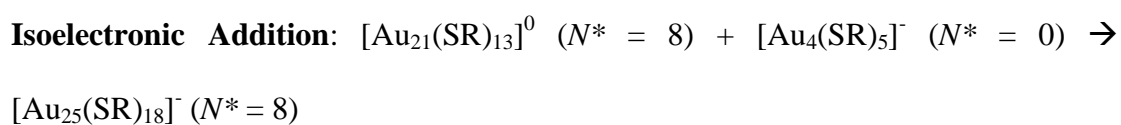
Supplementary Note 1. Proposed formation reaction pathways of $[\text{Au}_{15}(\text{SR})_{13}]^0$ by CO-reduction of $[\text{Au}_{10}(\text{SR})_{10}]^0$.



Given that CO-reduction of Au(I)-SR complexes resulted in a mixture of $[\text{Au}_n(\text{SR})_m]^q$ NCs with varied N^* values ($N^* = 2-10$), a size-focusing process of these mix-sized $[\text{Au}_n(\text{SR})_m]^q$ could lead to the formation of $[\text{Au}_{25}(\text{SR})_{18}]^-$. Besides the abovementioned reduction-growth reaction, the size-focusing process may also involve a couple of other reactions, such as isoelectronic addition, isoelectronic etching, and comproportionation. Isoelectronic addition refers to a reaction where the size of NC increases by associating 0 e⁻ Au(I)-SR complexes while the valence electron count keeps unchanged. For instance, 8 e⁻ $[\text{Au}_{21}(\text{SR})_{13}]^0$ could associate with a $[\text{Au}_4(\text{SR})_5]^-$, giving rise to $[\text{Au}_{25}(\text{SR})_{18}]^-$ (Isoelectronic Addition, Supplementary Note 2). By the contrary, in a typical isoelectronic etching reaction (Isoelectronic Etching, Supplementary Note 2), free thiolate ligands would attack and split a large-sized NC, resulting in a small-sized NC with the same valence electron count and a 0 e⁻ Au(I)-SR complex. Besides the isoelectronic reactions, a typical

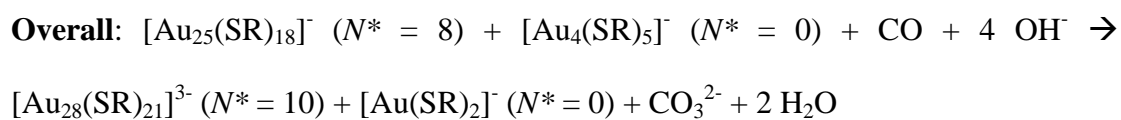
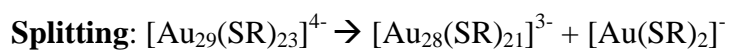
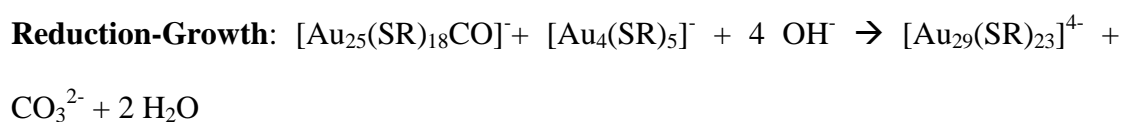
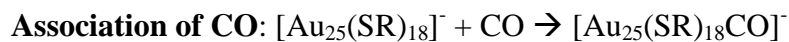
comproportionation reaction is also shown in Supplementary Note 2, where a NC with moderate size and N^* value (e.g., $[\text{Au}_{25}(\text{SR})_{18}]^-$) is produced at the expense of a NC with larger size and N^* value (e.g., $[\text{Au}_{28}(\text{SR})_{21}]^{3-}$) together with a NC with smaller size and N^* value (e.g., $[\text{Au}_{22}(\text{SR})_{17}]^-$).

Supplementary Note 2. Proposed isoelectronic addition, isoelectronic etching, and comproportionation reactions occurring in the formation of $[\text{Au}_{25}(\text{SR})_{18}]^-$.

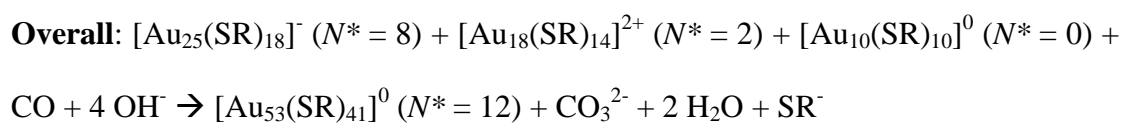
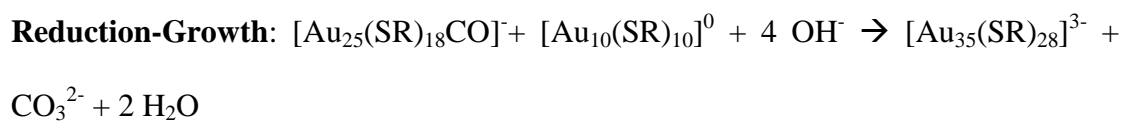
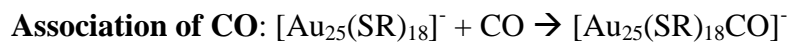


Supplementary Notes for Stage I

Supplementary Note 3. Proposed mechanism for Au₂₅-mediated formation of [Au₂₈(SR)₂₁]³⁻ via LaMer-like mechanism.

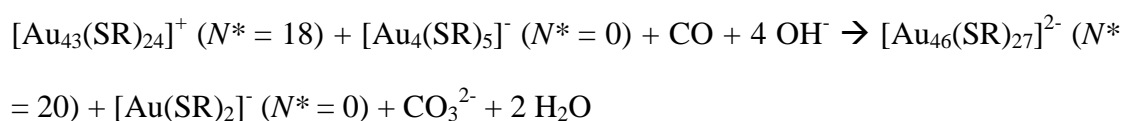
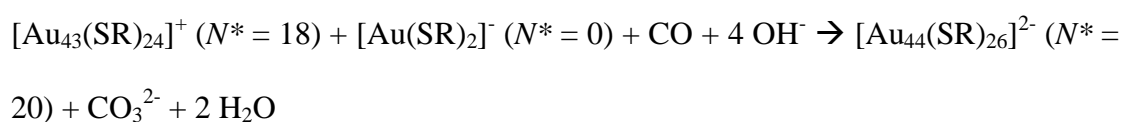
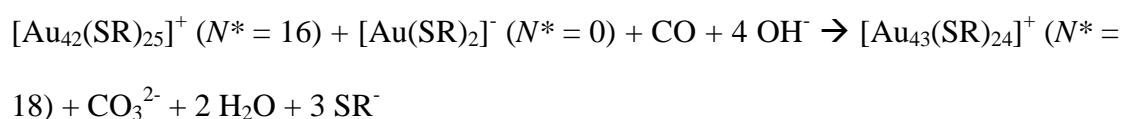
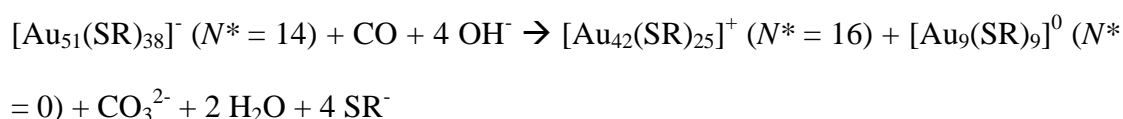
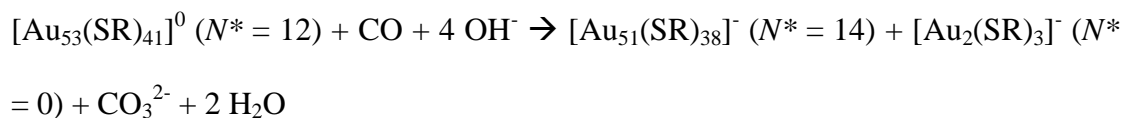


Supplementary Note 4. Proposed mechanism for Au₂₅-mediated formation of [Au₅₃(SR)₄₁]⁰ via aggregative growth mechanism.

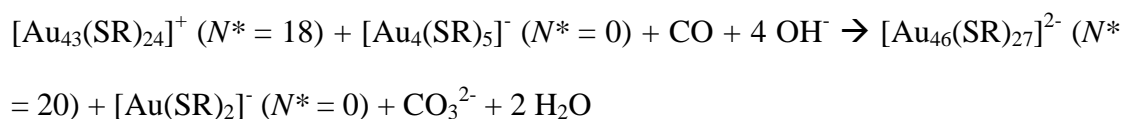
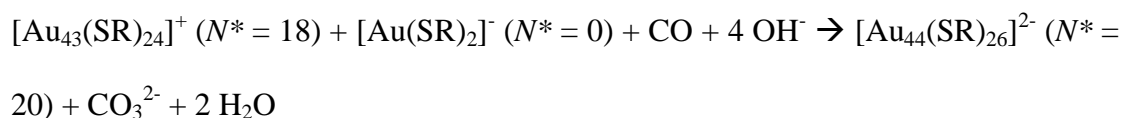
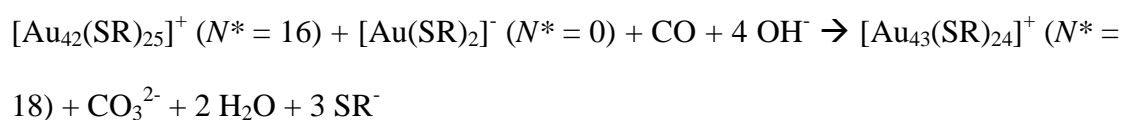
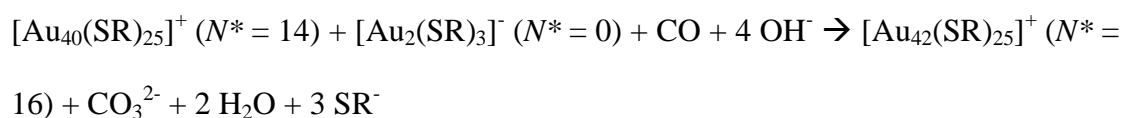
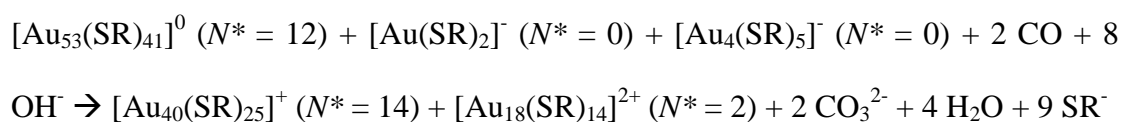


Supplementary Note 5. Proposed mechanism for size evolution from 12 e⁻ [Au₅₃(SR)₄₁]⁰ to 20 e⁻ [Au₄₄(SR)₂₆]²⁻ or [Au₄₆(SR)₂₇]⁻.

Pathway 1:

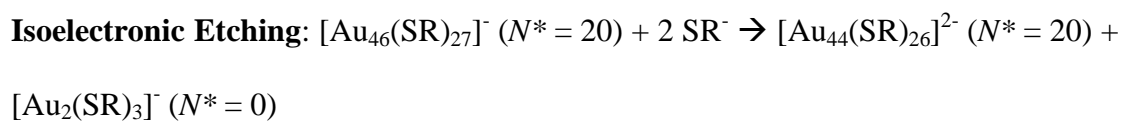
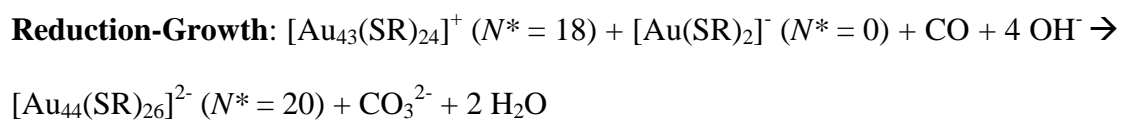


Pathway 2:



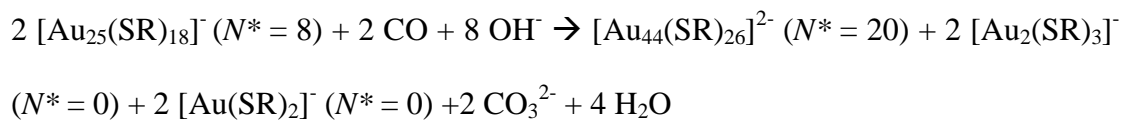
Supplementary Notes for Stage II

Supplementary Note 6. Proposed model reactions in the thermodynamically controlled size-focusing.



Supplementary Notes for Relative Stability of $[\text{Au}_{25}(\text{SR})_{18}]^-$ and $[\text{Au}_{44}(\text{SR})_{26}]^{2-}$

Supplementary Note 7. Proposed reaction to connect $[\text{Au}_{25}(\text{SR})_{18}]^-$ and $[\text{Au}_{44}(\text{SR})_{26}]^{2-}$ thermodynamically.



$$\Delta H = -400 \text{ kcal per mol of } [\text{Au}_{44}(\text{SR})_{26}]^{2-} \text{ or } -200 \text{ kcal per mol of } [\text{Au}_{25}(\text{SR})_{18}]^-$$

To compute this energy, the energy of each species in a Conductor-like Screening Model (COSMO) solvation model was obtained at the DFT-TPSS/def2-SV(P) level²⁻

5.

Supplementary Discussion

Proposed formation and consumption pathways for each NC species are detailed in this section.

$2 e^-$, $[\text{Au}_{10}(\text{SR})_8]^0$

Formation:

- $2 [\text{Au}_5(\text{SR})_5]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{10}(\text{SR})_8]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^-$
- $[\text{Au}_6(\text{SR})_6]^0 + [\text{Au}_4(\text{SR})_4]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{10}(\text{SR})_8]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^-$
- $[\text{Au}_6(\text{SR})_6]^0 + [\text{Au}_4(\text{SR})_5]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{10}(\text{SR})_8]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^-$
- $[\text{Au}_8(\text{SR})_8]^0 + [\text{Au}_2(\text{SR})_3]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{10}(\text{SR})_8]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^-$
- $[\text{Au}_9(\text{SR})_9]^0 + [\text{Au}(\text{SR})_2]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{10}(\text{SR})_8]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^-$
- $[\text{Au}_{10}(\text{SR})_{10}]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{10}(\text{SR})_8]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^-$

Consumption:

- $[\text{Au}_{10}(\text{SR})_8]^0 + [\text{Au}_5(\text{SR})_5]^0 \rightarrow [\text{Au}_{15}(\text{SR})_{13}]^0$
- $[\text{Au}_{10}(\text{SR})_8]^0 + [\text{Au}_8(\text{SR})_8]^0 \rightarrow [\text{Au}_{18}(\text{SR})_{14}]^{2+} + 2 \text{SR}^-$
- $2 [\text{Au}_{10}(\text{SR})_8]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{20}(\text{SR})_{14}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^-$

$2 e^{-}$, $[\text{Au}_{15}(\text{SR})_{13}]^0$

Formation:

- $[\text{Au}_8(\text{SR})_8]^0 + [\text{Au}_7(\text{SR})_7]^0 + \text{CO} + 4 \text{OH}^{-} \rightarrow [\text{Au}_{15}(\text{SR})_{13}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^{-}$
- $[\text{Au}_9(\text{SR})_9]^0 + [\text{Au}_6(\text{SR})_6]^0 + \text{CO} + 4 \text{OH}^{-} \rightarrow [\text{Au}_{15}(\text{SR})_{13}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^{-}$
- $[\text{Au}_{11}(\text{SR})_{11}]^0 + [\text{Au}_4(\text{SR})_4]^0 + \text{CO} + 4 \text{OH}^{-} \rightarrow [\text{Au}_{15}(\text{SR})_{13}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^{-}$
- $[\text{Au}_{11}(\text{SR})_{11}]^0 + [\text{Au}_4(\text{SR})_5]^{-} + \text{CO} + 4 \text{OH}^{-} \rightarrow [\text{Au}_{15}(\text{SR})_{13}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^{-}$
- $[\text{Au}_{13}(\text{SR})_{13}]^0 + [\text{Au}_2(\text{SR})_3]^{-} + \text{CO} + 4 \text{OH}^{-} \rightarrow [\text{Au}_{15}(\text{SR})_{13}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^{-}$
- $[\text{Au}_{14}(\text{SR})_{14}]^0 + [\text{Au}(\text{SR})_2]^{-} + \text{CO} + 4 \text{OH}^{-} \rightarrow [\text{Au}_{15}(\text{SR})_{13}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^{-}$
- $[\text{Au}_{10}(\text{SR})_8]^0 + [\text{Au}_5(\text{SR})_5]^0 \rightarrow [\text{Au}_{15}(\text{SR})_{13}]^0$

Consumption:

- $[\text{Au}_{15}(\text{SR})_{13}]^0 + [\text{Au}_5(\text{SR})_5]^0 + 2 \text{CO} + 8 \text{OH}^{-} \rightarrow [\text{Au}_{20}(\text{SR})_{14}]^0 + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 4 \text{SR}^{-}$
- $[\text{Au}_{15}(\text{SR})_{13}]^0 + [\text{Au}_7(\text{SR})_7]^0 + 2 \text{CO} + 8 \text{OH}^{-} \rightarrow [\text{Au}_{22}(\text{SR})_{17}]^{-} + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 3 \text{SR}^{-}$
- $[\text{Au}_{15}(\text{SR})_{13}]^0 + [\text{Au}_{10}(\text{SR})_8]^0 + 2 \text{CO} + 8 \text{OH}^{-} \rightarrow [\text{Au}_{25}(\text{SR})_{17}]^0 + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 4 \text{SR}^{-}$
- $[\text{Au}_{15}(\text{SR})_{13}]^0 + [\text{Au}_{10}(\text{SR})_8]^0 + 2 \text{CO} + 8 \text{OH}^{-} \rightarrow [\text{Au}_{25}(\text{SR})_{18}]^{-} + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 3 \text{SR}^{-}$

$2 e^-$, $[\text{Au}_{18}(\text{SR})_{14}]^{2+}$

Formation:

- $2 [\text{Au}_9(\text{SR})_9]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{18}(\text{SR})_{14}]^{2+} + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 4 \text{SR}^-$
- $[\text{Au}_{11}(\text{SR})_{11}]^0 + [\text{Au}_7(\text{SR})_7]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{18}(\text{SR})_{14}]^{2+} + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 4 \text{SR}^-$
- $[\text{Au}_{13}(\text{SR})_{13}]^0 + [\text{Au}_5(\text{SR})_5]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{18}(\text{SR})_{14}]^{2+} + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 4 \text{SR}^-$
- $[\text{Au}_{14}(\text{SR})_{14}]^0 + [\text{Au}_4(\text{SR})_4]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{18}(\text{SR})_{14}]^{2+} + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 4 \text{SR}^-$
- $[\text{Au}_{14}(\text{SR})_{14}]^0 + [\text{Au}_4(\text{SR})_5]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{18}(\text{SR})_{14}]^{2+} + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 5 \text{SR}^-$
- $[\text{Au}_{10}(\text{SR})_8]^0 + [\text{Au}_8(\text{SR})_8]^0 \rightarrow [\text{Au}_{18}(\text{SR})_{14}]^{2+} + 2 \text{SR}^-$
- $[\text{Au}_{53}(\text{SR})_{41}]^0 + [\text{Au}(\text{SR})_2]^- + [\text{Au}_4(\text{SR})_4]^0 + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{40}(\text{SR})_{25}]^+ + [\text{Au}_{18}(\text{SR})_{14}]^{2+} + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 8 \text{SR}^-$
- $[\text{Au}_{53}(\text{SR})_{41}]^0 + [\text{Au}(\text{SR})_2]^- + [\text{Au}_4(\text{SR})_5]^- + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{40}(\text{SR})_{25}]^+ + [\text{Au}_{18}(\text{SR})_{14}]^{2+} + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 9 \text{SR}^-$

Consumption:

- $[\text{Au}_{18}(\text{SR})_{14}]^{2+} + [\text{Au}_2(\text{SR})_3]^- + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{20}(\text{SR})_{14}]^0 + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 3 \text{SR}^-$
- $[\text{Au}_{18}(\text{SR})_{14}]^{2+} + [\text{Au}_4(\text{SR})_4]^0 + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{22}(\text{SR})_{17}]^- + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + \text{SR}^-$
- $[\text{Au}_{18}(\text{SR})_{14}]^{2+} + [\text{Au}_4(\text{SR})_5]^- + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{22}(\text{SR})_{17}]^- + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 2 \text{SR}^-$
- $[\text{Au}_{18}(\text{SR})_{14}]^{2+} + [\text{Au}_{25}(\text{SR})_{18}]^- + [\text{Au}_{10}(\text{SR})_{10}]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{53}(\text{SR})_{41}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + \text{SR}^-$

$6 e^-$, $[\text{Au}_{20}(\text{SR})_{14}]^0$

Formation:

- $2 [\text{Au}_{10}(\text{SR})_8]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{20}(\text{SR})_{14}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^-$
- $[\text{Au}_{15}(\text{SR})_{13}]^0 + [\text{Au}_5(\text{SR})_5]^0 + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{20}(\text{SR})_{14}]^0 + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 4 \text{SR}^-$
- $[\text{Au}_{18}(\text{SR})_{14}]^{2+} + [\text{Au}_2(\text{SR})_3]^- + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{20}(\text{SR})_{14}]^0 + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 3 \text{SR}^-$

Consumption:

- $[\text{Au}_{20}(\text{SR})_{14}]^0 + [\text{Au}_2(\text{SR})_3]^- \rightarrow [\text{Au}_{22}(\text{SR})_{17}]^-$
- $[\text{Au}_{20}(\text{SR})_{14}]^0 + [\text{Au}(\text{SR})_2]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{21}(\text{SR})_{13}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^-$
- $[\text{Au}_{20}(\text{SR})_{14}]^0 + [\text{Au}_4(\text{SR})_4]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{24}(\text{SR})_{16}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^-$
- $[\text{Au}_{20}(\text{SR})_{14}]^0 + [\text{Au}_4(\text{SR})_5]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{24}(\text{SR})_{16}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^-$
- $[\text{Au}_{20}(\text{SR})_{14}]^0 + [\text{Au}_5(\text{SR})_5]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{25}(\text{SR})_{17}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^-$
- $[\text{Au}_{20}(\text{SR})_{14}]^0 + [\text{Au}_5(\text{SR})_5]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{25}(\text{SR})_{18}]^- + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + \text{SR}^-$
- $[\text{Au}_{20}(\text{SR})_{14}]^0 + [\text{Au}_9(\text{SR})_9]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{29}(\text{SR})_{21}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^-$
- $[\text{Au}_{33}(\text{SR})_{22}]^- + [\text{Au}_{20}(\text{SR})_{14}]^0 \rightarrow [\text{Au}_{43}(\text{SR})_{24}]^+ + [\text{Au}_{10}(\text{SR})_{10}]^0 + 2 \text{SR}^-$

$6 e^-$, $[\text{Au}_{22}(\text{SR})_{17}]^-$

Formation:

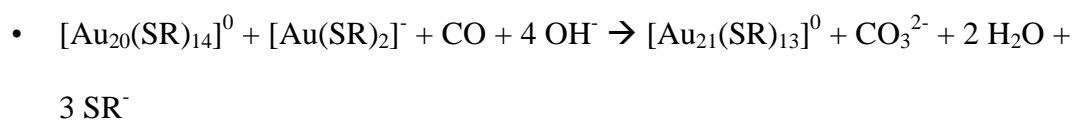
- $[\text{Au}_{15}(\text{SR})_{13}]^0 + [\text{Au}_7(\text{SR})_7]^0 + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{22}(\text{SR})_{17}]^- + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 3 \text{SR}^-$
- $[\text{Au}_{18}(\text{SR})_{14}]^{2+} + [\text{Au}_4(\text{SR})_4]^0 + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{22}(\text{SR})_{17}]^- + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + \text{SR}^-$
- $[\text{Au}_{18}(\text{SR})_{14}]^{2+} + [\text{Au}_4(\text{SR})_5]^- + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{22}(\text{SR})_{17}]^- + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 2 \text{SR}^-$
- $[\text{Au}_{20}(\text{SR})_{14}]^0 + [\text{Au}_2(\text{SR})_3]^- \rightarrow [\text{Au}_{22}(\text{SR})_{17}]^-$

Consumption:

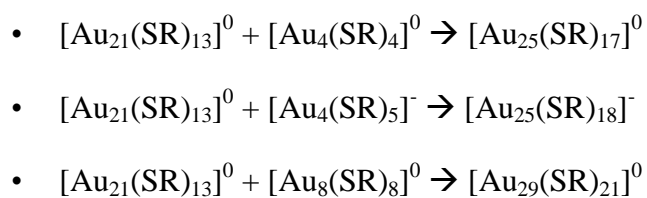
- $[\text{Au}_{22}(\text{SR})_{17}]^- + [\text{Au}_2(\text{SR})_3]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{24}(\text{SR})_{16}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 4 \text{SR}^-$
- $[\text{Au}_{22}(\text{SR})_{17}]^- + [\text{Au}_7(\text{SR})_7]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{29}(\text{SR})_{21}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^-$
- $[\text{Au}_{28}(\text{SR})_{21}]^{3-} + [\text{Au}_{22}(\text{SR})_{17}]^- \rightarrow 2 [\text{Au}_{25}(\text{SR})_{18}]^- + 2 \text{SR}^-$

8 e⁻, [Au₂₁(SR)₁₃]⁰

Formation:



Consumption:



$8 e^{-}$, $[\text{Au}_{24}(\text{SR})_{16}]^0$

Formation:

- $[\text{Au}_{20}(\text{SR})_{14}]^0 + [\text{Au}_4(\text{SR})_4]^0 + \text{CO} + 4 \text{OH}^{-} \rightarrow [\text{Au}_{24}(\text{SR})_{16}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^{-}$
- $[\text{Au}_{20}(\text{SR})_{14}]^0 + [\text{Au}_4(\text{SR})_5]^{-} + \text{CO} + 4 \text{OH}^{-} \rightarrow [\text{Au}_{24}(\text{SR})_{16}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^{-}$
- $[\text{Au}_{22}(\text{SR})_{17}]^{-} + [\text{Au}_2(\text{SR})_3]^{-} + \text{CO} + 4 \text{OH}^{-} \rightarrow [\text{Au}_{24}(\text{SR})_{16}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 4 \text{SR}^{-}$

Consumption:

- $[\text{Au}_{24}(\text{SR})_{16}]^0 + [\text{Au}(\text{SR})_2]^{-} \rightarrow [\text{Au}_{25}(\text{SR})_{18}]^{-}$
- $[\text{Au}_{24}(\text{SR})_{16}]^0 + [\text{Au}_5(\text{SR})_5]^0 \rightarrow [\text{Au}_{29}(\text{SR})_{21}]^0$
- $[\text{Au}_{24}(\text{SR})_{16}]^0 + \text{CO} + 4 \text{OH}^{-} \rightarrow [\text{Au}_{24}(\text{SR})_{14}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^{-}$

8 e⁻, [Au₂₅(SR)₁₇]⁰

Formation:

- $[\text{Au}_{15}(\text{SR})_{13}]^0 + [\text{Au}_{10}(\text{SR})_8]^0 + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{25}(\text{SR})_{17}]^0 + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 4 \text{SR}^-$
- $[\text{Au}_{20}(\text{SR})_{14}]^0 + [\text{Au}_5(\text{SR})_5]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{25}(\text{SR})_{17}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^-$
- $[\text{Au}_{21}(\text{SR})_{13}]^0 + [\text{Au}_4(\text{SR})_4]^0 \rightarrow [\text{Au}_{25}(\text{SR})_{17}]^0$
- $[\text{Au}_{25}(\text{SR})_{18}]^- + [\text{Au}_4(\text{SR})_4]^0 \rightarrow [\text{Au}_{25}(\text{SR})_{17}]^0 + [\text{Au}_4(\text{SR})_5]^-$

Consumption:

- $[\text{Au}_{25}(\text{SR})_{17}]^0 + \text{SR}^- \rightarrow [\text{Au}_{25}(\text{SR})_{18}]^-$
- $[\text{Au}_{25}(\text{SR})_{17}]^0 + [\text{Au}_4(\text{SR})_4]^0 \rightarrow [\text{Au}_{29}(\text{SR})_{21}]^0$

8 e⁻, [Au₂₅(SR)₁₈]⁻

Formation:

- [Au₁₅(SR)₁₃]⁰ + [Au₁₀(SR)₈]⁰ + 2 CO + 8 OH⁻ → [Au₂₅(SR)₁₈]⁻ + 2 CO₃²⁻ + 4 H₂O + 3 SR⁻
- [Au₂₀(SR)₁₄]⁰ + [Au₅(SR)₅]⁰ + CO + 4 OH⁻ → [Au₂₅(SR)₁₈]⁻ + CO₃²⁻ + 2 H₂O + SR⁻
- [Au₂₁(SR)₁₃]⁰ + [Au₄(SR)₅]⁻ → [Au₂₅(SR)₁₈]⁻
- [Au₂₄(SR)₁₆]⁰ + [Au(SR)₂]⁻ → [Au₂₅(SR)₁₈]⁻
- [Au₂₅(SR)₁₇]⁰ + SR⁻ → [Au₂₅(SR)₁₈]⁻
- [Au₂₉(SR)₂₁]⁰ + SR⁻ → [Au₂₅(SR)₁₈]⁻ + [Au₄(SR)₄]⁰
- [Au₂₈(SR)₂₁]³⁻ + [Au₂₂(SR)₁₇]⁻ → 2 [Au₂₅(SR)₁₈]⁻ + 2 SR⁻

Consumption:

- [Au₂₅(SR)₁₈]⁻ + [Au₄(SR)₄]⁰ → [Au₂₅(SR)₁₇]⁰ + [Au₄(SR)₅]⁻
- [Au₂₅(SR)₁₈]⁻ + [Au₄(SR)₅]⁻ + CO + 4 OH⁻ → [Au₂₈(SR)₂₁]³⁻ + [Au(SR)₂]⁻ + CO₃²⁻ + 2 H₂O
- [Au₂₅(SR)₁₈]⁻ + [Au₁₈(SR)₁₄]²⁺ + [Au₁₀(SR)₁₀]⁰ + CO + 4 OH⁻ → [Au₅₃(SR)₄₁]⁰ + CO₃²⁻ + 2 H₂O + SR⁻

8 e⁻, [Au₂₉(SR)₂₁]⁰

Formation:

- $[\text{Au}_{20}(\text{SR})_{14}]^0 + [\text{Au}_9(\text{SR})_9]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{29}(\text{SR})_{21}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 2 \text{SR}^-$
- $[\text{Au}_{22}(\text{SR})_{17}]^- + [\text{Au}_7(\text{SR})_7]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{29}(\text{SR})_{21}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^-$
- $[\text{Au}_{21}(\text{SR})_{13}]^0 + [\text{Au}_8(\text{SR})_8]^0 \rightarrow [\text{Au}_{29}(\text{SR})_{21}]^0$
- $[\text{Au}_{24}(\text{SR})_{16}]^0 + [\text{Au}_5(\text{SR})_5]^0 \rightarrow [\text{Au}_{29}(\text{SR})_{21}]^0$
- $[\text{Au}_{25}(\text{SR})_{17}]^0 + [\text{Au}_4(\text{SR})_4]^0 \rightarrow [\text{Au}_{29}(\text{SR})_{21}]^0$

Consumption:

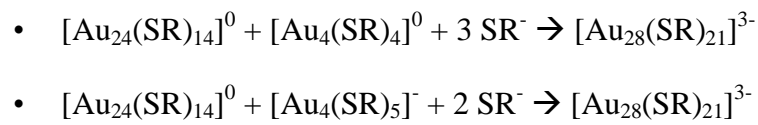
- $[\text{Au}_{29}(\text{SR})_{21}]^- + \text{SR}^- \rightarrow [\text{Au}_{25}(\text{SR})_{18}]^- + [\text{Au}_4(\text{SR})_4]^0$

10 e⁻, [Au₂₄(SR)₁₄]⁰

Formation:



Consumption:



10 e⁻, [Au₂₈(SR)₂₁]³⁻

Formation:

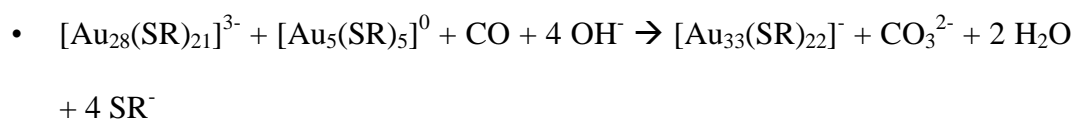
- $[\text{Au}_{25}(\text{SR})_{18}]^- + [\text{Au}_4(\text{SR})_5]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{28}(\text{SR})_{21}]^{3-} + [\text{Au}(\text{SR})_2]^- + \text{CO}_3^{2-} + 2 \text{H}_2\text{O}$
- $[\text{Au}_{24}(\text{SR})_{14}]^0 + [\text{Au}_4(\text{SR})_4]^0 + 3 \text{SR}^- \rightarrow [\text{Au}_{28}(\text{SR})_{21}]^{3-}$
- $[\text{Au}_{24}(\text{SR})_{14}]^0 + [\text{Au}_4(\text{SR})_5]^- + 2 \text{SR}^- \rightarrow [\text{Au}_{28}(\text{SR})_{21}]^{3-}$

Consumption:

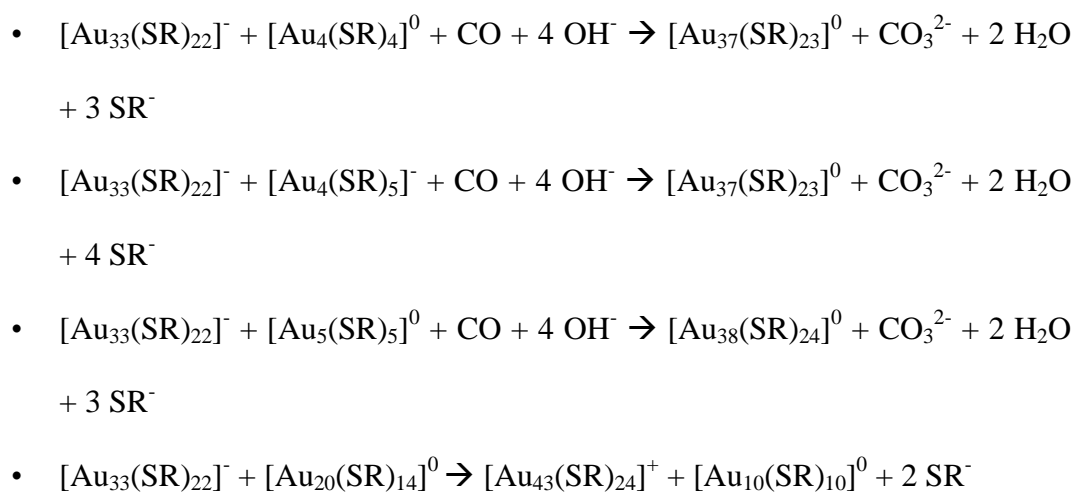
- $[\text{Au}_{28}(\text{SR})_{21}]^{3-} + [\text{Au}_5(\text{SR})_5]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{33}(\text{SR})_{22}]^- + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 4 \text{SR}^-$
- $[\text{Au}_{28}(\text{SR})_{21}]^{3-} + [\text{Au}_{22}(\text{SR})_{17}]^- \rightarrow 2 [\text{Au}_{25}(\text{SR})_{18}]^- + 2 \text{SR}^-$

12 e⁻, [Au₃₃(SR)₂₂]⁻

Formation:

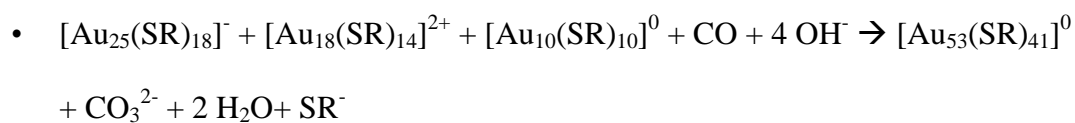


Consumption:

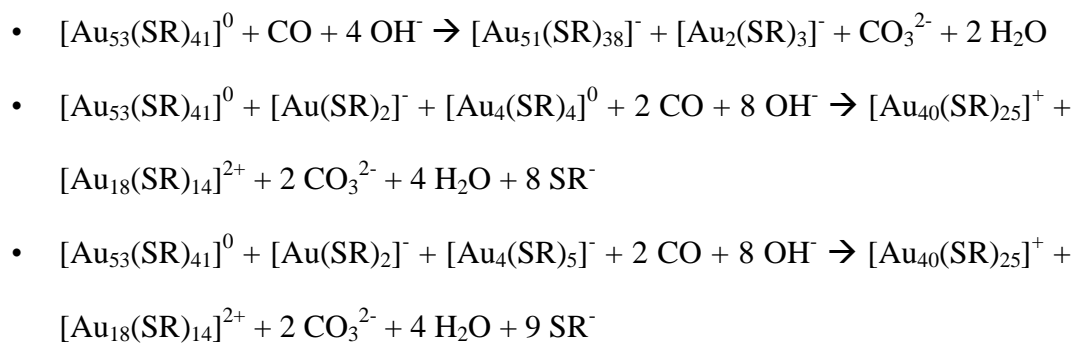


12 e⁻, [Au₅₃(SR)₄₁]⁰

Formation:



Consumption:



14 e⁻, [Au₃₇(SR)₂₃]⁰

Formation:

- $[\text{Au}_{33}(\text{SR})_{22}]^- + [\text{Au}_4(\text{SR})_4]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{37}(\text{SR})_{23}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^-$
- $[\text{Au}_{33}(\text{SR})_{22}]^- + [\text{Au}_4(\text{SR})_5]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{37}(\text{SR})_{23}]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 4 \text{SR}^-$

Consumption:

- $[\text{Au}_{37}(\text{SR})_{23}]^0 + [\text{Au}(\text{SR})_2]^- \rightarrow [\text{Au}_{38}(\text{SR})_{24}]^0 + \text{SR}^-$

14 e⁻, [Au₃₈(SR)₂₄]⁰

Formation:

- [Au₃₃(SR)₂₂]⁻ + [Au₅(SR)₅]⁰ + CO + 4 OH⁻ → [Au₃₈(SR)₂₄]⁰ + CO₃²⁻ + 2 H₂O
+ 3 SR⁻
- [Au₃₇(SR)₂₃]⁰ + [Au(SR)₂]⁻ → [Au₃₈(SR)₂₄]⁰ + SR⁻

Consumption:

- [Au₃₈(SR)₂₄]⁰ + [Au₂(SR)₃]⁻ → [Au₄₀(SR)₂₅]⁺ + 2 SR⁻
- [Au₃₈(SR)₂₄]⁰ + [Au₄(SR)₄]⁰ + CO + 4 OH⁻ → [Au₄₂(SR)₂₅]⁺ + CO₃²⁻ + 2 H₂O
+ 3 SR⁻
- [Au₃₈(SR)₂₄]⁰ + [Au₄(SR)₅]⁻ + CO + 4 OH⁻ → [Au₄₂(SR)₂₅]⁺ + CO₃²⁻ + 2 H₂O
+ 4 SR⁻

14 e⁻, [Au₄₀(SR)₂₅]⁺

Formation:

- $[\text{Au}_{53}(\text{SR})_{41}]^0 + [\text{Au}(\text{SR})_2]^- + [\text{Au}_4(\text{SR})_4]^0 + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{40}(\text{SR})_{25}]^+ + [\text{Au}_{18}(\text{SR})_{14}]^{2+} + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 8 \text{SR}^-$
- $[\text{Au}_{53}(\text{SR})_{41}]^0 + [\text{Au}(\text{SR})_2]^- + [\text{Au}_4(\text{SR})_5]^- + 2 \text{CO} + 8 \text{OH}^- \rightarrow [\text{Au}_{40}(\text{SR})_{25}]^+ + [\text{Au}_{18}(\text{SR})_{14}]^{2+} + 2 \text{CO}_3^{2-} + 4 \text{H}_2\text{O} + 9 \text{SR}^-$
- $[\text{Au}_{38}(\text{SR})_{24}]^0 + [\text{Au}_2(\text{SR})_3]^- \rightarrow [\text{Au}_{40}(\text{SR})_{25}]^+ + 2 \text{SR}^-$

Consumption:

- $[\text{Au}_{40}(\text{SR})_{25}]^+ + [\text{Au}_{11}(\text{SR})_{11}]^0 + 2 \text{SR}^- \rightarrow [\text{Au}_{51}(\text{SR})_{38}]^-$
- $[\text{Au}_{40}(\text{SR})_{25}]^+ + [\text{Au}_2(\text{SR})_3]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{42}(\text{SR})_{25}]^+ + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^-$

14 e⁻, [Au₅₁(SR)₃₈]⁻

Formation:

- $[\text{Au}_{53}(\text{SR})_{41}]^0 + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{51}(\text{SR})_{38}]^- + [\text{Au}_2(\text{SR})_3]^- + \text{CO}_3^{2-} + 2 \text{H}_2\text{O}$
- $[\text{Au}_{40}(\text{SR})_{25}]^+ + [\text{Au}_{11}(\text{SR})_{11}]^0 + 2 \text{SR}^- \rightarrow [\text{Au}_{51}(\text{SR})_{38}]^-$

Consumption:

- $[\text{Au}_{51}(\text{SR})_{38}]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{42}(\text{SR})_{25}]^+ + [\text{Au}_9(\text{SR})_9]^0 + \text{CO}_3^{2-} + 2 \text{H}_2\text{O}$
+ 4 SR⁻

16 e⁻, [Au₄₂(SR)₂₅]⁺

Formation:

- [Au₃₈(SR)₂₄]⁰ + [Au₄(SR)₄]⁰ + CO + 4 OH⁻ → [Au₄₂(SR)₂₅]⁺ + CO₃²⁻ + 2 H₂O + 3 SR⁻
- [Au₃₈(SR)₂₄]⁰ + [Au₄(SR)₅]⁻ + CO + 4 OH⁻ → [Au₄₂(SR)₂₅]⁺ + CO₃²⁻ + 2 H₂O + 4 SR⁻
- [Au₄₀(SR)₂₅]⁺ + [Au₂(SR)₃]⁻ + CO + 4 OH⁻ → [Au₄₂(SR)₂₅]⁺ + CO₃²⁻ + 2 H₂O + 3 SR⁻
- [Au₅₁(SR)₃₈]⁻ + CO + 4 OH⁻ → [Au₄₂(SR)₂₅]⁺ + [Au₉(SR)₉]⁰ + CO₃²⁻ + 2 H₂O + 4 SR⁻
- 2 [Au₄₃(SR)₂₄]⁺ + 3 SR⁻ → [Au₄₄(SR)₂₆]²⁻ + [Au₄₂(SR)₂₅]⁺

Consumption:

- [Au₄₂(SR)₂₅]⁺ + [Au(SR)₂]⁻ + CO + 4 OH⁻ → [Au₄₃(SR)₂₄]⁺ + CO₃²⁻ + 2 H₂O + 3 SR⁻

18 e⁻, [Au₄₃(SR)₂₄]⁺

Formation:

- $[\text{Au}_{42}(\text{SR})_{25}]^+ + [\text{Au}(\text{SR})_2]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{43}(\text{SR})_{24}]^+ + \text{CO}_3^{2-} + 2 \text{H}_2\text{O} + 3 \text{SR}^-$
- $[\text{Au}_{33}(\text{SR})_{22}]^- + [\text{Au}_{20}(\text{SR})_{14}]^0 \rightarrow [\text{Au}_{43}(\text{SR})_{24}]^+ + [\text{Au}_{10}(\text{SR})_{10}]^0 + 2 \text{SR}^-$

Consumption:

- $[\text{Au}_{43}(\text{SR})_{24}]^+ + [\text{Au}(\text{SR})_2]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{44}(\text{SR})_{26}]^{2-} + \text{CO}_3^{2-} + 2 \text{H}_2\text{O}$
- $[\text{Au}_{43}(\text{SR})_{24}]^+ + [\text{Au}_4(\text{SR})_5]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{46}(\text{SR})_{27}]^- + [\text{Au}(\text{SR})_2]^- + \text{CO}_3^{2-} + 2 \text{H}_2\text{O}$

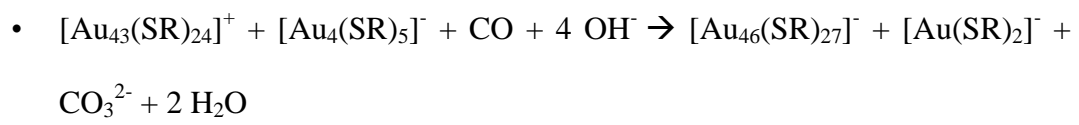
20 e⁻, [Au₄₄(SR)₂₆]²⁻

Formation:

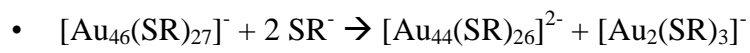
- $[\text{Au}_{43}(\text{SR})_{24}]^+ + [\text{Au}(\text{SR})_2]^- + \text{CO} + 4 \text{OH}^- \rightarrow [\text{Au}_{44}(\text{SR})_{26}]^{2-} + \text{CO}_3^{2-} + 2 \text{H}_2\text{O}$
- $[\text{Au}_{46}(\text{SR})_{27}]^- + 2 \text{SR}^- \rightarrow [\text{Au}_{44}(\text{SR})_{26}]^{2-} + [\text{Au}_2(\text{SR})_3]^-$

20 e⁻, [Au₄₆(SR)₂₇]⁻

Formation:



Consumption:



Supplementary References

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