

# **Stability and dissociation pathways of doped $Au_nX^+$ clusters ( $X = Y, Er, Nb$ )**

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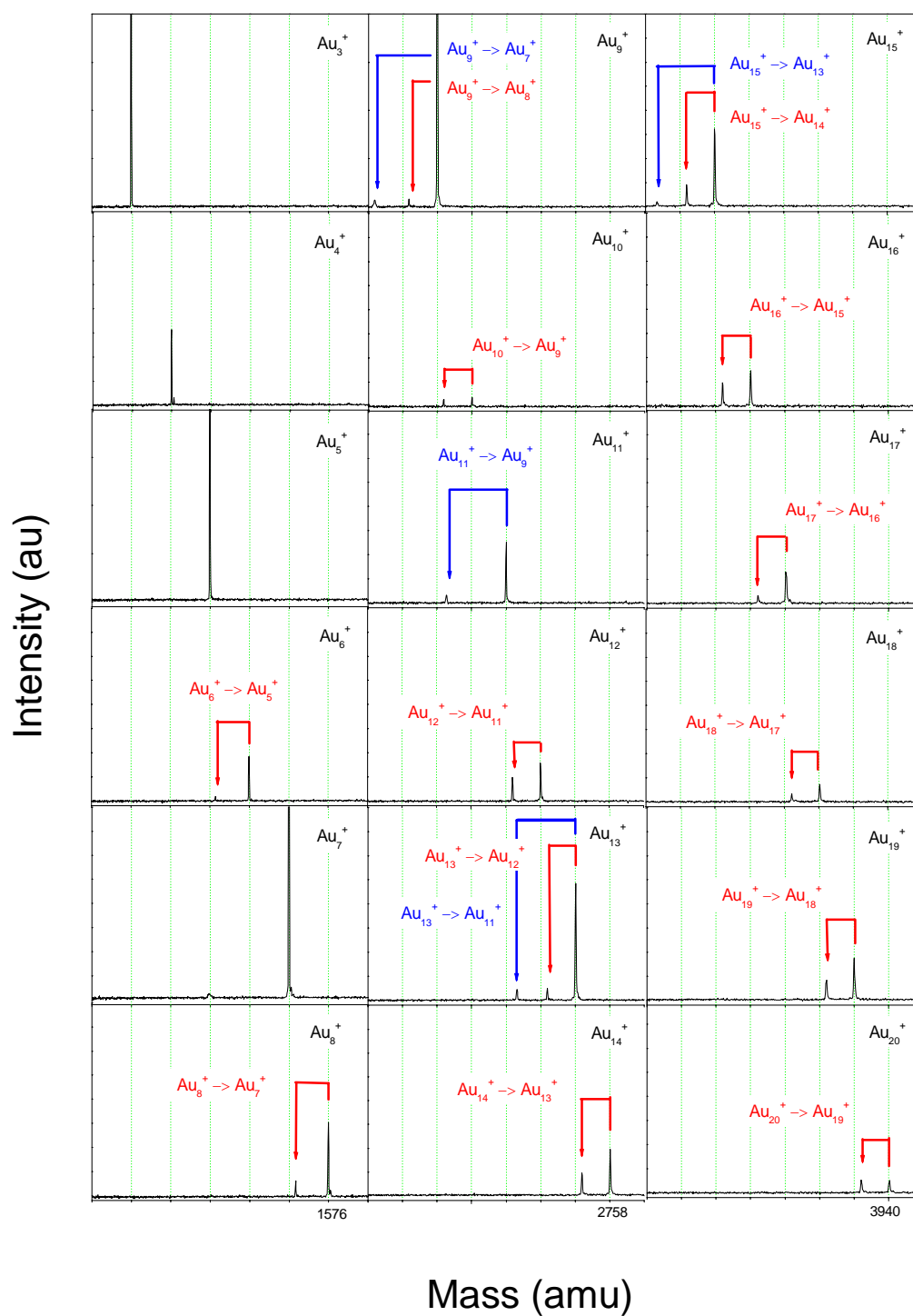
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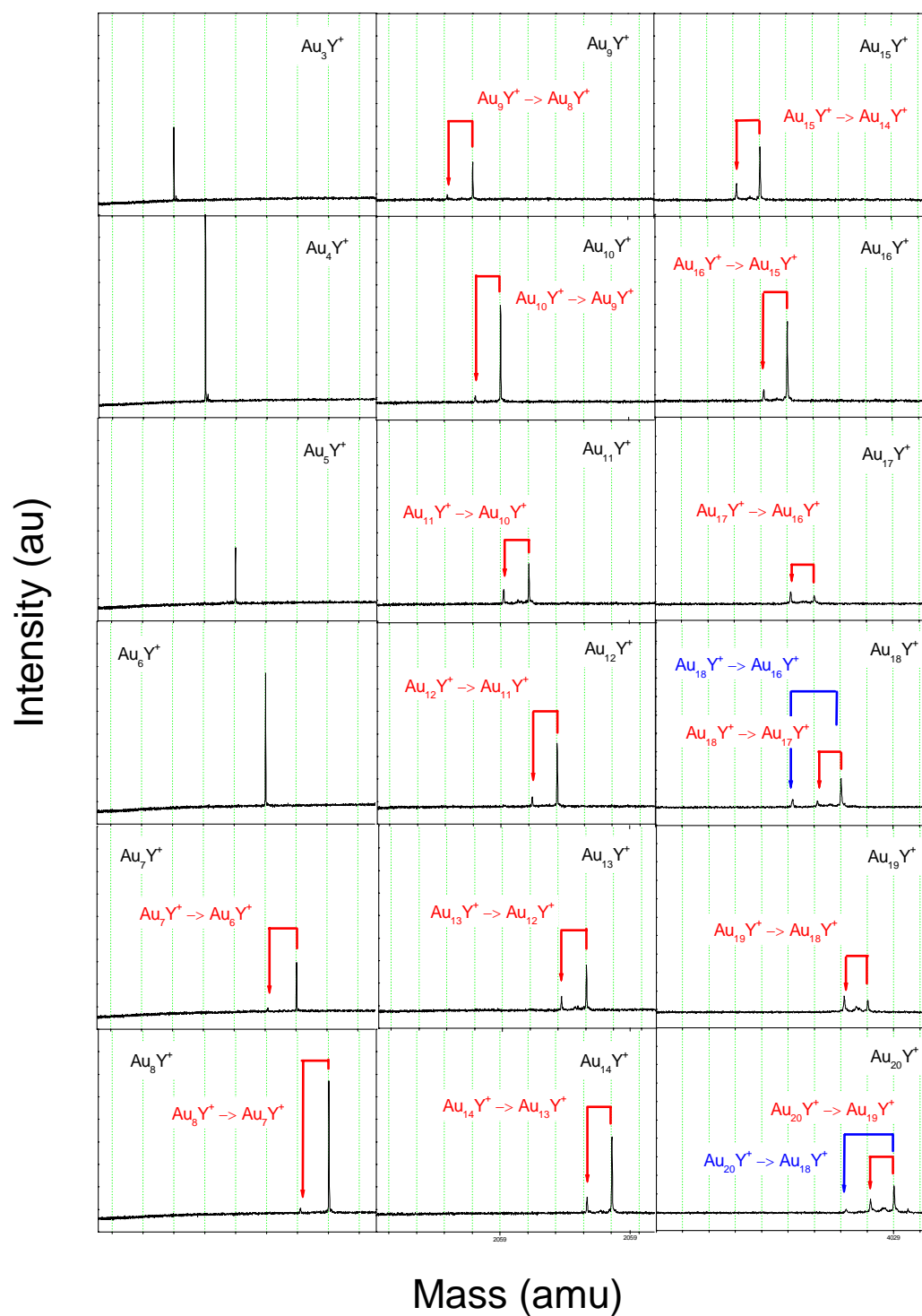
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## **Supplementary Information**

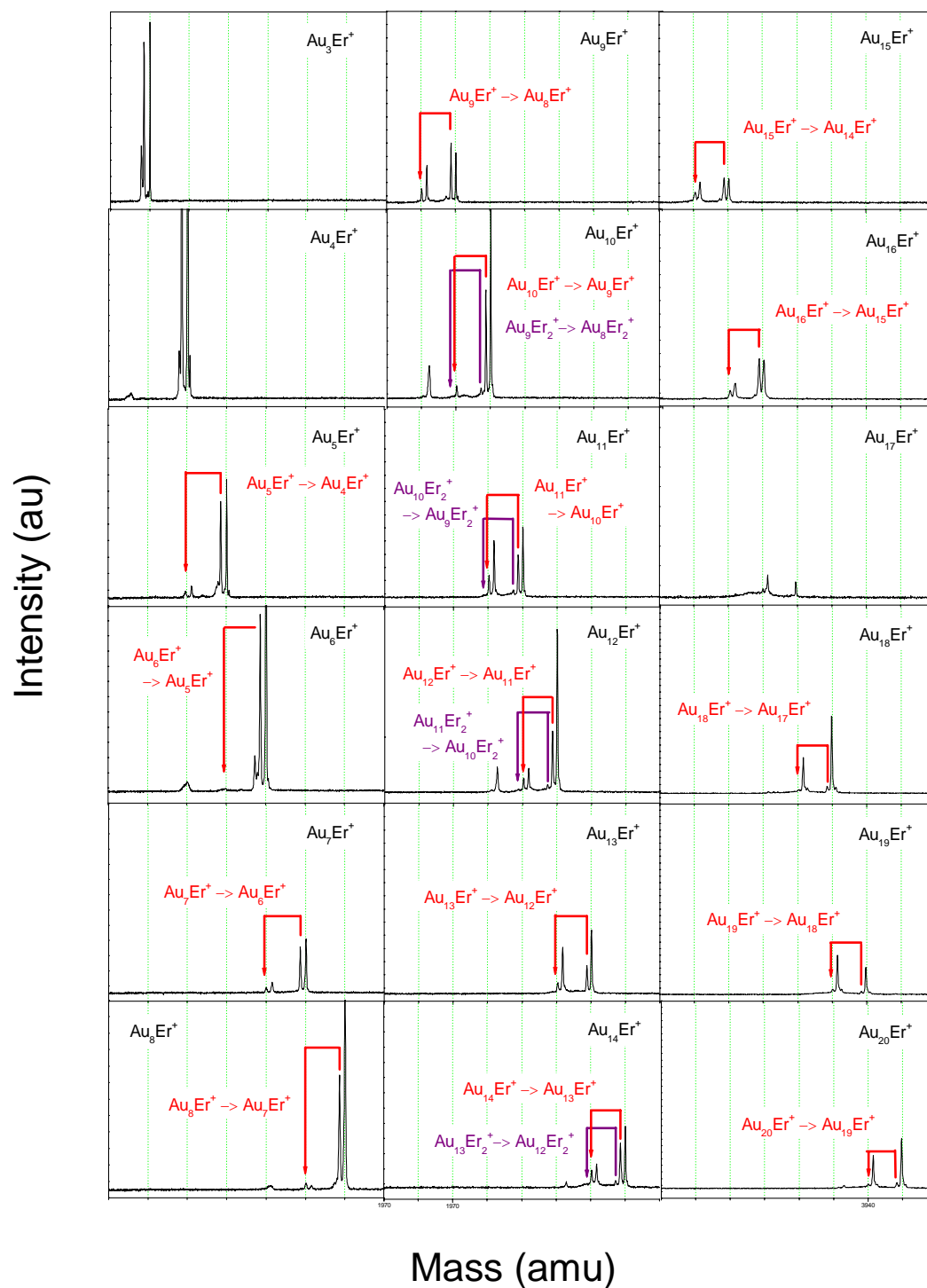
Metastable fragmentation pathways of  $Au_n^+$ ,  $Au_nY^+$ ,  $Au_nEr^+$  ( $n = 3-20$ ), and  $Au_nNb^+$   
( $n = 3-14$ ).



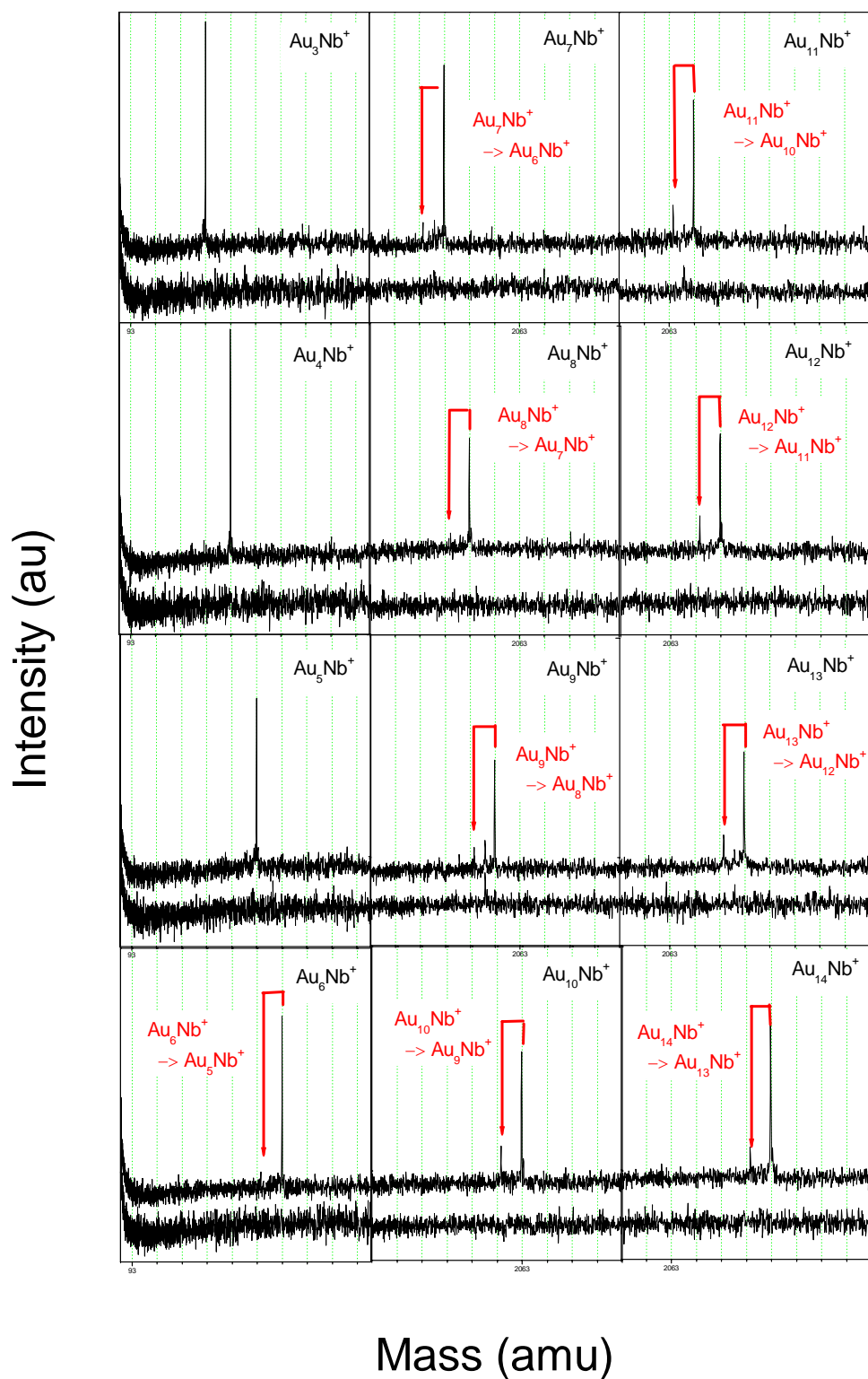
**Fig. S1.** Metastable fragmentation of  $Au_n^+$  ( $n = 3-20$ ) clusters. The dashed lines indicate the expected positions of the  $Au_n^+$  mass peaks in case they would not have been deflected by the mass selector. The most intense peak corresponds to the selected cluster; the smaller peaks correspond to metastable fragments. The dissociation channels are given by labelled arrows.



**Fig. S2.** Metastable fragmentation of Au<sub>n</sub>Y<sup>+</sup> ( $n = 3-20$ ) clusters. The dotted vertical lines correspond to the expected positions of the Au<sub>n</sub>Y<sup>+</sup> species.



**Fig. S3.** Metastable fragmentation of mass selected groups of peaks:  $Au_{n+1} Er^+$ ,  $Au_n Er^+$ ,  $Au_{n-1} Er_2^+$  with  $n = 3-20$ . The dotted grid lines correspond to pure  $Au_{n+1} Er^+$  species. The nearest peak to the left of the pure cluster peak corresponds to  $Au_n Er^+$ , the second nearest, only visible for some sizes, corresponds to  $Au_{n-1} Er_2^+$ . The fragments of the erbium doped species are labelled, non labelled fragments are stemming from the pure gold clusters, shown in Fig. a.



**Fig. S4.** Metastable fragmentation of  $Au_nNb^+$  ( $n = 3-14$ ) clusters. The bottom curves show the signal visible without any Nb in the clusters and were recorded as a reference. The dashed lines indicate the expected positions of the  $Au_nNb^+$  clusters.