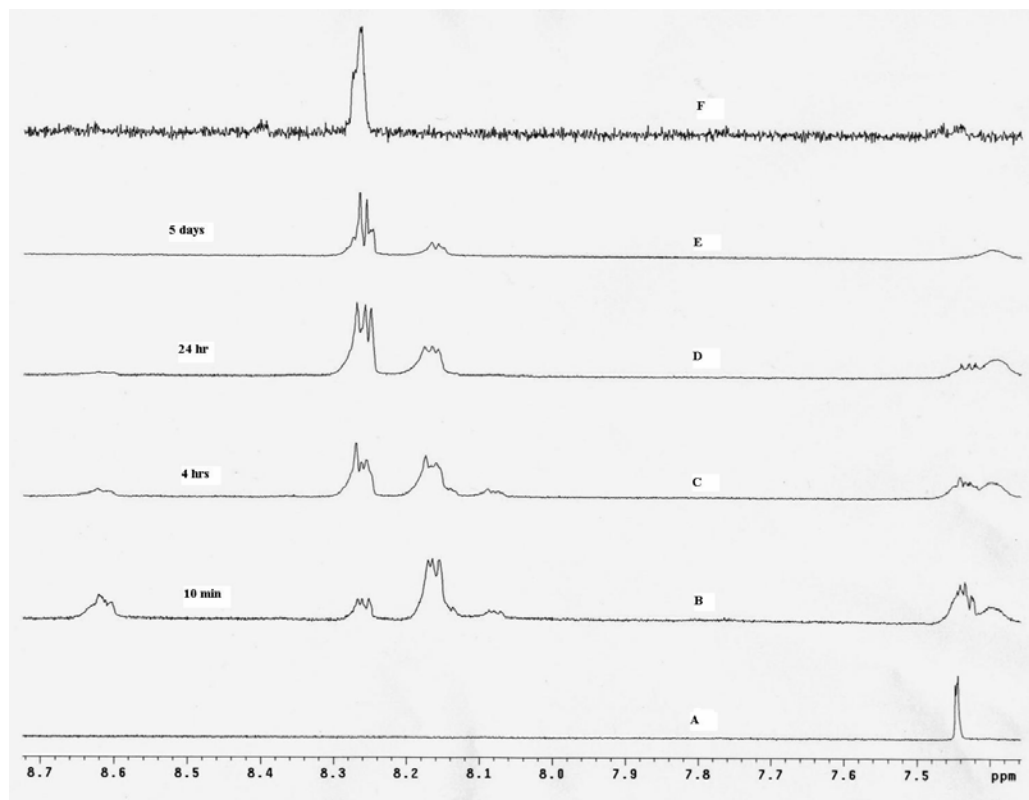


Supplementary material related to NMR spectra



**Figure.** <sup>1</sup>H NMR spectra of the exchange reaction of the dinuclear gold(I) amidinate complex  $\text{Au}_2(2,6\text{-Me}_2\text{Ph-form})_2$ , **1**, with the  $\text{K}(4\text{-MePh-form})$  in  $\text{CDCl}_3$ . <sup>1</sup>H NMR spectra; **A** dinuclear gold(I) complex, **1**, **B-E** showing the intermediate peaks at 8.62, 8.07 ppm, the tetranuclear product  $\text{Au}_4(4\text{-MePh-form})_4$ ,  $\text{K}(4\text{-MePh-form})$  and the exchanged ligand,  $\text{K}(2,6\text{-Me}_2\text{Ph-form})$ , methine peaks at 8.26, 8.14 and 7.39 ppm respectively and **F** the tetranuclear complex  $\text{Au}_4(4\text{-MePh-form})_4$ .

The ligand exchange reaction of the dinuclear gold(I) amidinate complex  $\text{Au}_2(2,6\text{-Me}_2\text{Ph-form})_2$ , **1**, with the  $\text{K}(4\text{-MePh-form})$ , was studied by <sup>1</sup>H NMR. An NMR tube was charged with the dinuclear gold(I) complex, **1**, in  $\text{CDCl}_3$  to give the dinuclear methine peak at 7.44 ppm, spectrum **A**.  $\text{K}(4\text{-MePh-form})$  was added to the NMR tube. After 10 min of mixing new peaks at 8.62 and 8.07 ppm were formed, indicating the formation of an intermediate. Its intensity started to decrease after ~ 4h until it

disappeared completely after 24h while the intensity of the tetranuclear product  $\text{Au}_4(4\text{-MePh-form})_4$ , methine peak at 8.26 ppm increased. The tetranuclear product methine peak at 8.26 ppm formed during the exchange reaction and up to 5 days showed a splitting which is different from the single peak at 8.62 ppm, obtained from  $^1\text{H}$  NMR of the tetranuclear complex  $\text{Au}_4(4\text{-MePh-form})_4$  formed by the reaction of the potassium amidinate salt,  $\text{K}(4\text{-MePh-form})$  with  $\text{Au}(\text{THT})\text{Cl}$ , spectra **F**. These results indicate that they may be formation of other tetranuclear species. These compounds have not been characterized.