



On the stability of the $\text{Sg}(\text{CO})_6$ complex

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Chemical properties of the superheavy elements (SHE) are unique due to the strong relativistic effects, which influence their properties, e.g., the stability of the metal-ligand bonding in carbonyl complexes, which are SHE compounds featuring a metal-carbon bond as is typical for organometallic compounds. The formation of the carbonyl complex of Sg ($Z = 106$) and its interaction with a silicon oxide surface was reported more than 10 years ago [1]. Further developments to study this compound class have been performed to prepare measurements of the stability of $\text{Sg}(\text{CO})_6$ [2], and the synthesis of a carbonyl complex with Bh ($Z = 107$) [3]. A new study of the carbonyl complex formation with ^{259}Sg , produced in the cold-fusion nuclear reaction $^{52}\text{Cr}(^{208}\text{Pb}, 1n)^{259}\text{Sg}$, has been performed at the TASCA separator at GSI Darmstadt, Germany. An advanced detection setup for the detection of non-volatile and volatile products was applied in this study, which provides new information on the stability of $\text{Sg}(\text{CO})_6$ complex.

References

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