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Studies of the thermal stability of Sg(CO)₆

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In recent years gas phase chemical studies assisted by physical pre-separation allowed for the investigation of fragile single molecular species by gas phase chromatography. The latest success revealed the formation of a highly volatile carbonyl species of the heaviest group 6 transactinide seaborgium and its adsorption interaction with quartz surfaces. We report here on preliminary results of a second generation experiment to investigate the intramolecular bond between the central metal atom of the complexes and the ligands addressing the influence of relativistic effects in the heaviest compounds. Results are shown in conjunction with a suggestion of a data analysis revealing a weaker metal-carbon bond within this complex for Sg compared to its lighter homologue tungsten. Furthermore, our study reveals the formation of a secondary, less volatile carbonyl species for Mo and to a lesser extent for W.