

Thursday

May 11th

At 3:45 PM



Gas Phase Chemistry of Flerovium and $\text{Sg}(\text{CO})_6$

Abstract:

Approaching the heaviest elements with $Z \geq 112$, gas chemical studies are best performed by the coupling of chemistry setups to an electromagnetic separator, as the needed sensitivity can be assured only by strong suppression of unwanted volatile species [1]. The gas-chromatography studies of Fl at the gas-filled separator TASCA were started in 2009. Two Fl atoms were found in the first experiment, deposited on the gold surface at room temperature [2]. Several Fl atoms were registered in two subsequent experiments at TASCA performed in 2014/2015. The use of an advanced detection setup COMPACT allowed the detection of species in a wide volatility range from the non-volatile Pb through the volatile metal Hg to the noble gas Rn. The recent results will be presented, and the adsorption properties of Fl on gold will be discussed.

The new compound was recently investigated for Sg (element 106), $\text{Sg}(\text{CO})_6$ – the first organometallic compound of superheavy elements. Sg atoms were pre-separated in a gas-filled separator GARIS and stopped in a gas mixture containing CO gas [3]. This technique was developed with lighter homologs Mo and W at TRIGA Mainz reactor and at TASCA [4]. The adsorption behavior of $\text{Sg}(\text{CO})_6$ was studied by gas-solid chromatography in comparison with nearest homologs in the group, Mo and W [3].

Reference:

- [1] Ch.E. Düllmann et al., *Radiochim. Acta*, **97**, 403 (2009).
- [2] A. Yakushev et al., *Inorg. Chem.* **53**, 1624 (2014).
- [3] J. Even et al., *Science* **345**, 1491 (2014).
- [4] J. Even et al., *Inorg.Chem.* **51**, 6431-6422 (2012).

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Refreshments will be
served at 3:30 pm



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