

**MODEL STUDIES OF MERCURY
FOR A FUTURE EXPERIMENT WITH ELEMENT 112**

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The heaviest member of the periodic table whose chemistry has been investigated so far is element 108 (Hassium, Hs). After the discovery of long-lived superheavy elements in Dubna, Russia, the investigation of their chemical properties becomes feasible. First chemical studies are concentrating on element 112, which is expected to be a member of group 12, i.e. homologous to Hg.

Numerous physico-chemical properties of element 112 and other superheavy elements have been extrapolated on the basis of the properties of the homologous elements^[2] or evaluated from relativistic calculations.

In a future 112 experiment the same experimental set-up IVO (*In-situ Volatilization and On-line detection*) that has been successfully applied for the first ever chemical study of hassium will be used. In this device, element 112 in its elemental state will be adsorbed on PIN-detectors in a cryogenic gas thermochromatography system^[5] covering a temperature range from 0 °C to –170°C. In order to increase the adsorption temperature, the PIN-diodes will be covered by nano-layers of noble metals such as Au, Pd or Pt.

In order to properly select the best-suited metal, off-line thermochromatography studies with carrier-free amounts of Hg isotopes on noble metals have been performed. The experiments yielded adsorption enthalpies of Hg on these surfaces.

These investigations were followed by on-line experiments at the PSI-PHILIPS cyclotron where short-lived Hg-isotopes were produced in the reaction $^{168}\text{Yb} (^{20}\text{Ne}, \text{xn})$ $^{180-182}\text{Hg}$ and continuously transported in He gas to the IVO apparatus. First results of these on-line studies will be outlined.