

### Status of heaviest elements as of April 2010

Element 112, discovered by the GSI group, has been confirmed elsewhere and is well established. In 2010 the name “copernicium” (Cp) was approved by IUPAC (Pure and Applied Chemistry **682**, 753–755 (2010)).

The identification of isotopes of elements 113–116, 118 has been reported in an extensive series of papers by a collaboration of JINR (Dubna) and LLNL researchers starting in 1998; see Yu. Ts. Oganessian *et al.*, Phys. Rev. **C72**, 034611 (2005) and references therein. Most have been produced from fusion reactions of  $^{48}\text{Ca}$  on actinide targets; more neutron-deficient isotopes have been produced elsewhere using lead targets.

A topical review by Yu. Ts. Oganessian (J. Phys. G **34**, R165–R242 (2007)) reports

$Z = 118 : A = 294$  (three atoms by end of 2006)

$Z = 116 : A = 290\text{--}293$

$Z = 115 : A = 287, 288$

$Z = 114 : A = 286, 287, 286\text{--}289$

$Z = 113 : A = 276, 282\text{--}284$

$Z = 112 : A = 282\text{--}285$

and synthesis of element 117 via  $^{48}\text{Ca} + ^{249}\text{Bk}$  was reported in Yu. Ts. Oganessian *et al.*, Phys. Rev. Lett. **114**, 142502 (2010):

$Z = 117 A = 293, 294$  ,

where blue indicates a Pb target, red an actinide target.

The LBNL group has reported independent confirmation of Element 114 production in the  $^{48}\text{Ca} + ^{242}\text{Pu}$  reaction (L. Stavsetra *et al.*, Phys. Rev. Lett. **103**, 132502 (25 Sept. 2009)).

There have not yet been confirmations of any other  $Z > 112$  elements from Darmstadt (GSI), LBNL, Japan, or elsewhere, although partial confirmations seem to exist.

See also S. Hofmann & G. Münzenberg, Rev. Mod. Phys. **72**, 733–767 (2000).

Updated 27 April 2010 by DEG.