# Preliminary Results with “Cincinnati Group Cell” of Thorium "Transmutation" Under 50 Hz AC Excitation,

by F. Celani *et al*.

**The complete version of this April 1998 paper appeared on pp. 56-61 of the printed *Proceedings* of ICCF7 as can be verified from its Table of Contents posted at:**

**http://web.pdx.edu/~pdx00210/Cfc/Histry/ICCF/iccf7cont.htm**

**The following appears to have been an edited/condensed version, absent graphs and tables, either from a preliminary version made available before the final printed *Proceedings* &/or as edited/posted by *New Energy News* in June of 1998:**

**from http://www.padrak.com/ine/NEN_6_2_4.html (accessed 08/1804).**

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**TRANSMUTATION PRELIMINARY RESULTS PAPER**

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From: NEN, Vol. 6, No. 2, June 1998, pp. 17-18.

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TRANSMUTATION PRELIMINARY RESULTS

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We performed, at the CISE Nuclear Laboratory from February '98, four experiments with the so called "Cincinnati Group Cell", which consisted of a Zr-Zr cell using a 50 Hz AC line current found in Italy.

The first two experiments where "blank" control runs that were mainly aimed to understand the intrinsic peculiarity of this kind of AC electrolysis.

In experiment #1, we added 80 mM of NaNO3 and one drop (i.e. 20 mM) of 37% HCl to 25 ml of de-ionized water electrolyte. The experiment was performed following, as close as possible, the I-V-T protocol developed by the Cincinnati Group (CG). We experienced a very large and abrupt temperature and pressure increase which broke the safety valve. We then analyzed the material inside the cell and found nothing strange: only Zr, Hf, and Na. The cell was then mechanically cleaned by removing approximately 0.1 mm of the surface.

Experiment #2 was similar to #1 except that no NaNO3 was added and we modified the I-V-T protocol to avoid a large pressure buildup i.e., starting electrolysis from as low as 10 V (not 50 V minimum according to CG protocol) and we waited to increase the voltage further until the current "naturally" decreased. Using this method, we reached voltages as high as 220 V instead of maximum of 177 V specified in the CG procedure. Subsequent SEM analysis of the particulate from this run showed only Zr, O, and C1. ICP-MS showed: Zr and Hf.

Experiment #3 was made using 25 ml of electrolyte that came from a solution composed of 100 ml of de-ionized water that contained one gram of Th (NO3)4*XH2O plus 20 mM (one drop) of 37% HCl. Radiometric intensities of Th in the initial solution were 1.0 of 232Th and 12.6 of 230Th indicating that it was not only "natural" 232Th. The experiment was run for 55 minutes with Imax = 2.6A; Vmax = 22OV, Pmax = 30psi. Subsequent qualitative ICP-MS revealed B, Cs, Hg, Cu, Na, A1, V, Cr, Ni, Zn, Pb, and Mn. A chemical balance indicated 18% of the original Th was missing, and a radiometric balance (alpha + Beta) showed a 12% Th deficit.

Experiment #4 was made following, as close as possible, the CG protocol (except that we started at 10 V to avoid a repetition of the large pressure increase). The experiment ran for 55 min with Imax = 4.8 A; Vmax = l8OV; Pmax = l90 psi. Subsequent ICP-MS and ICP-optical analyses strongly suggests, based on our experience, that the results were very similar to experiment #3. Chemical balance showed 78 mg of Th remaining from the 102 mg initial quantity. **Other elements detected were 10B and 11B (3.2 mg), Cu (l.0 - 1.5 mg) but not in normal isotopic ratio, 133Cs (0.2 mg), and Hg (0.16 mg). The following elements were qualitatively detected: Na, A1, V, Cr; Ni, Zn, Pb, and Mn.** When we used only ICP-MS, several other masses appeared compared to when we used combined ICP-MS and ICP-optical analysis. A post-run radiometric balance (alpha + beta) showed a 14% Th deficit, but it did not have unusual unbalanced isotopic ratio.

Further studies are underway to more fully understand our preliminary results.