LOW ENERGY COLLECTIVE STATES IN THE SOFT $^{182}$Pt NUCLEUS

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Abstract
Nuclear spectroscopy has been done on $^{182}$Pt nucleus; a particle level scheme is given.

In 1973 at the end of Isolde 1 (CERN) continuing our platinum nuclei systematical1, we studied on-line the $^{182}$Hg decay process. The $^{182}$Hg mass separated ion-beam was weak; it was sufficient to obtain rather precise $\gamma$ and conversion electron spectra of the different decays ($^{182}$Hg→$^{180}$Au, $T^{1/2}$ = 11.2 sec; $^{180}$Au→$^{178}$Pt $T^{1/2}$ = 22.1 sec; $^{178}$Pt→$^{176}$Ir, $T^{1/2}$ = 156 sec); detailed coincidence experiments were not possible at that time and we proposed a very partial level scheme, based mainly on energy combinations2).

With the recently rebuilt 600 MeV proton S.C. and Isolde 2, the activity collected from the separator was roughly ten times higher than Isolde 1 and permitted triple $e^-\gamma\gamma$ coincidence experiments. The activity was transported to the counting devices with a new tape transport system. The coincidence events we recorded on a magnetic tape unit driven by a Plurimat (Intertechnique) computer system. The sorting of the data was realised on disks with the A.R.I.E.L system in Orsay (IBM 370-135). Analysis of the gated spectra either or electron side, or in both $\gamma\gamma$ sides lead to a more precise level scheme of the $^{182}$Pt nucleus up to 1.3 MeV. The main results are the following:

- the ground state band is fed till the $4^+$ state instead of the $6^+$ in $^{184,186}$Pt; this can be in favour of a rather low spin for the $^{182}$Au ground state (similar to the $^{190,192}$Au),

- we confirm the spin, parity and location of the $0^+$ excited state at 499.5 keV (see fig.1),

- the states 499.5 keV ($0^+$), 865.3 keV ($2^+$) appear to be the lowest numbers of a "quasi $\beta$" band,

- a perturbed "$\gamma$ band" can be constructed on the 667 keV ($2^+$) state; this indicates still a $\gamma$ instability for the $^{182}$Pt nucleus and a large odd-even effect for the excited states of this"band".

We had located some years ago the oblate-prolate shape transition between $^{188}$Pt, $^{186}$Pt. It appears that the 3 transitionnal $^{182,184,186}$Pt nuclei are very similar (see fig.2). The band structure remains after the transition but an evolution toward a pure axial symmetry rotational structure is not seen.

References
3) R. Foucher et al., International Conf. on properties of Nuclear states, Montréal 1969, Presses Université de Montréal, p. 682.

Fig. 1