Contribution ID: **44** Type: **Submitted**

β^-decay spectroscopy study of the ^{232}Ra β^-decay chain

Wednesday 15 December 2021 12:05 (12 minutes)

C. Sotty on behalf of IS650/IS665 IDS, IFIN-HH, Univ. York, IKS Leuven collaborations

The ^{232}Ra β^- decay chain was investigated through β and γ-ray spectroscopy at CERN-ISOLDE. A radioactive beam of ^{232}Fr and ^{232}Ra was implanted on the ISOLDE Decay Station tape, where the γ-rays originating from the β^- decay chains ^{232}Fr-^{232}Ra-^{232}Ac-^{232}Th were registered using a mixed array consisting of (4 HPGe- 2 $LaBr_3$(Ce)–1 Beta) detectors arranged in close geometry. The production yields were measured for different experimental conditions of UC_x targets, also involving the formation of ^{213}RaF molecular beam inducing a substantial contamination.

Prior to our study, K.-L. Gippert et *al.* used the multinucleon transfer reaction to produce the ^{232}Ra precursor. Due to low statistics and the absence of γ-γ coincidences, only a few γ-ray transitions were associated with ^{232}Ac. In the present work, we report on revised and considerably extended level schemes for ^{232}Ac (24 new γ-rays, 19 new levels) and ^{232}Th (67 new γ-rays, 36 new levels), revealing the existence of new structures lying at higher energy and a different β-strength distribution. Thanks to our low γ-ray/X-ray energy capabilities, few $K\text{-}shell$ internal conversion coefficients have been newly extracted for ^{232}Ac, providing clues to assign multi-polarities to the related transitions. An isomeric state at $E_x = 97.7$ keV, on top of which a newly discovered structure is build, was identified and measured in ^{232}Ac with HPGe detector array using the standard electronic timing technique.

The experimental results will be discussed and confronted to the systematics present neighbouring nuclei, where similar structures/mechanisms are observed.

Author: SOTTY, Christophe (Horia Hulubei National Institute of Physics and Nuclear Engineering (RO))

Presenter: SOTTY, Christophe (Horia Hulubei National Institute of Physics and Nuclear Engineering (RO))

Session Classification: Beta-decay and fundamental interactions