Spectroscopic studies of nuclei close to the proton drip-line in the region $Z = 30 - 38$

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During the last decade, several experiments aimed at studying neutron-deficient nuclei near or at the border of the proton drip line in the $Z = 30 - 38$ region. New isotopes were discovered and the proton drip line was indeed reached for odd-Z isotopes using projectile fragmentation [1-4] or fusion-evaporation reactions [5,6]. A recent experiment of ^{78}Kr projectile fragmentation, with the LISE (Line of Super Stripped Ions) spectrometer at GANIL [7], was performed to study spectroscopic properties of those very exotic nuclei :

1. decay of two isomers in ^{66}As [8] as well as β-decay half-life determination for some nuclei in this region [9]. These half-lives are important for the modelling of the astrophysical *rp* process and in particular for the isotope β-emitter ^{65}As, a key nucleus in the *rp* process ;
2. decay by β and $\beta\gamma$ emission of odd-odd $N = Z$ nuclei (^{62}Ga and ^{66}As), in order to determine, via their half-lives, the universal Ft value for superallowed Fermi transitions [10] ;
3. decay of $T_z = -1/2$ nuclei (^{67}Se and ^{71}Kr) by delayed βp emission to improve half-life and proton branching ratio measurements, as well as to seek for a ^{71}Kr isomer-to-be [11-14] ;
4. the very first measurement of half-lives and decay properties of ^{60}Ga and ^{64}As to find out if they are proton emitters (they would be then the lightest ones known to-date) or β emitters (which would open new paths for the *rp* process), and also obtain more accurate data on ^{61}Ga et ^{65}As,

the last results will be presented here.

The detection apparatus consisted of a silicon telescope, including a silicon strip detector (for x-y measurements) where the ions were implanted and their following decays observed while keeping track of the correlation between nuclei identification and radioactivity. High efficiency germanium detectors surrounded the silicon telescope.

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