

## BAND STRUCTURE OF $^{78}\text{Kr}$

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The level structure of  $^{78}\text{Kr}$  has been previously studied by  $\beta$ -decay, Coulomb excitation, charged particle and (HI,xn $\gamma$ ) spectroscopy<sup>1-5</sup>). We have investigated high spin states in this nucleus by means of the reaction  $^{65}\text{Cu}(^{16}\text{O},p2n)$  and the oxygen beams of the C. E. N. Saclay and Cologne University tandem accelerators. The level scheme proposed in fig.1 is based on a multiparameter  $\gamma\gamma$ -coincidence experiment performed at 58 MeV, angular distributions measured at 54 MeV and excitation functions taken between 42 and 58 MeV beam energy.

In the coincidence run, the two Ge(Li) detectors were placed at  $0^\circ$  and  $90^\circ$  to the beam which was stopped in a 0.5 mm Ta sheet supporting the  $350 \mu\text{g}/\text{cm}^2$  Cu target. Doppler broadened line shapes of the 858 keV  $6^+ \rightarrow 4^+$ , 1015 keV  $8^+ \rightarrow 6^+$  and 1112 keV  $10^+ \rightarrow 8^+$  gsb transitions were observed in coincidence with gates set in the  $90^\circ$  spectrum. In this fashion, the strong 1116 keV line following Coulomb excitation of  $^{65}\text{Cu}$  and delayed feeding of the 1978 keV  $6^+$  state from the negative parity band have been avoided. Further DSA  $\gamma$ -singles spectra on Y, Ag, Ta and Pb backings and for recoil into vacuum (full shift) have been accumulated between 42 and 58 MeV. Preliminary results are given in fig. 1.

Several longer mean lives have been deduced at 48 MeV beam energy from a recoil distance Doppler shift experiment in which two detectors at  $+30^\circ$  to the beam axis and a  $350 \mu\text{g}/\text{cm}^2$  target evaporated onto a  $0.5 \mu\text{m}$  Au foil have been used. The data have been analyzed as described previously<sup>6</sup>). The lifetimes of the 455 keV  $2^+$  and 1120 keV  $4^+$  states were found in good agreement with the results of Nolte et al.<sup>4</sup>). The preliminary lifetimes of the 1148, 1565, 1873, and 2300 keV members of the  $\gamma$ -band and of the 3288 keV ( $7^-$ ) state have not been corrected for cascade feeding.

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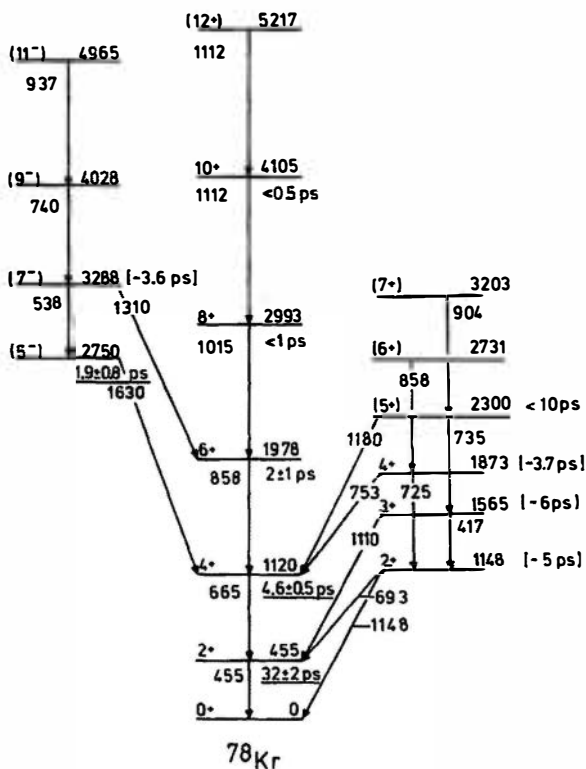


Fig. 1

Level scheme and mean lives of  $^{78}\text{Kr}$ ; the mean lives in brackets are preliminary values which have not been corrected for feeding.