We investigate the properties of high-K isomers in the isotopes of elements between Lutetium (Z= 71) and Tungsten (Z = 74) and the bands built upon them. In our work, we report recent experimental measurements of the magnetic dipole moment of the 37/2⁻ isomer in ¹⁷⁷Hf and of E2/M1 mixing ratios in transitions between levels of bands built upon the 23/2⁺ isomer and the 9/2⁻ single quasi-particle state in this isotope. The magnetic moments of band-head (I = K) states in the collective model are given by

\[ \mu = g_K \cdot [I^2/(I + 1)] + g_R [I/(I + 1)] \]

where \( g_K \) is the combined quasi-particle g-factor and \( g_R \) is the collective g–factor. The new results will form the basis for a discussion of the accuracy of additivity in prediction of the \( g_K \) values of high-K multi-quasi-particle states in this region. Using additivity as a principle to estimate \( g_K \) more widely opens the possibility to explore the variability of \( g_R \) using measured values of \( |g_K - g_R| \) from in-band branching ratios. The \( g_R \) parameter (given by the ratio \( I_p/I_p + I_n \) where \( I_p, I_n \) are the proton and neutron contributions to the total moment of inertia) is influenced by pairing, which acts to reduce, independently, both the proton and neutron contributions to the total moment of inertia. Pairing is blocked by the presence of quasi-particle excitations. With pairing neglected, \( g_R \) reduces to the simple ratio \( Z/A \). However \( g_R \) has sensitivity to the degree of blocking of each nucleon type and can vary above and below this value.

The high-K isomers provide the ideal region to explore this hitherto neglected sensitivity. Results from a review of the literature will be reported to demonstrate the sensitivity of \( g_R \) to single and multiple combinations of quasi-proton and quasi-neutron excitations. The deduced value of the parameter \( g_K \) has been widely used to aid identification of the quasi-particle make-up of different high-K isomers in the same nucleus, based on measurements of \( |g_K - g_R| \), assuming a single value of \( g_R \). Lack of regard for the variability of \( g_R \) can give rise to considerable error in \( g_K \) and possible mis-identification.

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