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Theoretical investigation of α -decay in Superheavy Isomers

Theoretical studies of superheavy nuclei are expected to bring in new opportunities and more exciting times in the arena of experimental activities eyeing on synthesis of new superheavy nuclei [1]. In this particular region of periodic chart, α -decay is the dominant decay mode in which transitions take place from ground-to-ground states [2] and also in or from isomeric state [3]. In the present work, inspired from recent experimental and theoretical [4, 5] studies on isomers, we have estimated α -decay half-lives from ground-to-ground states along with at least one decay from or in an isomeric state. The half-lives are calculated from few latest empirical formulas [6, 7] which are first probed on known isomers from the Atlas [8] that decay via α -emission. The QF formula [6] is found very accurate in estimating the half-lives of α -emission in isomeric state and therefore has been applied to estimate the half-lives of α -transitions from various unknown superheavy isomers. Our calculated half-lives are found within the experimental range and also in well agreement with other similar formula [7]. These investigations can anticipate the future experiments towards synthesizing new superheavy elements and their isomeric states.

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