HEAVIEST NUCLEI: SYNTHESIS AND DECAY PROPERTIES

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1 Introduction

A problem of possible existence of the “islands of stability” in the region of very heavy (superheavy) elements has long been the subject of intensive discussions. The interest in this problem is linked with determining the limit of nuclear mass existence, predicted by calculation on the basis of various theoretical models. One important consequence of these calculations [1-8] was the disclosure of a significant gap in the spectrum of low lying levels in the region of deformed nuclei around N = 162 (deformed shell) and hypothetical superheavy nuclei, viz. a new (following N = 126) closed spherical neutron shell N = 184. It was also shown that the considerable variations of the binding energy of spherical nuclei were due to the nuclear shells, and that shell effects might be present also in deformed “magic nuclei” (deformed shells). And finally, at further and quite significant increase of the deformation