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STRUCTURE OF LEVELS AND ELECTROMAGNETIC TRANSITION RATES IN ODD-ODD NUCLEI CLOSE TO DOUBLY-MAGIC NEUTRON DEFICIENT ^{100}Sn

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In our previous papers, we extensively studied odd-odd nuclei adjacent to doubly magical stable nuclide ^{208}Pb, as well as to also doubly magical neutron excess ^{132}Sn. To date, some experimental information has emerged also about the properties of such nuclei in the vicinity of an extremely neutron deficient and also doubly magical ^{100}Sn. In our calculations of odd-odd nuclei close to ^{100}Sn, we applied random phase approximation and multi-particle shell model, both based on the phenomenological nuclear potential [1] and effective two-body interaction [2], which parameters were defined by us before. The subject of our interest were $^{98}_{49}$In$_{49}$, $^{100}_{49}$In$_{51}$, $^{98}_{47}$Ag$_{51}$ and $^{94}_{45}$Rh$_{49}$. In these nuclei we determined energy spectra and $E2$, $M1$ transition rates. Effective transition operators were also defined by us before [3], and they successfully described $E2$ and $M1$ transitions in nuclei close to ^{208}Pb and ^{132}Sn. In particular, the values of proton and neutron effective charges were $e_p = 1.6|e|$ and $e_n = 0.9|e|$. In our case, the value of $e_p \approx 1.6|e|$ was also obtained by us by using the experimental $T_{1/2}$ values of the $8^+_1 \to 6^+_1$ and $6^+_1 \to 4^+_1$ transitions in $^{98}_{48}$Cd$_{50}$ [4], as well as our RPA calculation for these cases. However, the energy of an analogous $6^+_1 \to 4^+_1$ transition and its half-life in $^{102}_{50}$Sn$_{52}$ are known with great uncertainty [4, 5] and thus the value of neutron effective charge in nuclei close to^{100}Sn is also very uncertain [5]: $e_n = 2.3(+0.6 - 0.2)|e|$. Such a large value of neutron effective charge is a subject of discussions. Here, we defined the values of e_p and e_n from the joint description of the $4^+_1 \to 6^+_1(gr.st.)$ and $2^+_1 \to 4^+_1(gr.st.)$ transitions in ^{98}Ag and ^{94}Rh. The result is $e_p \approx 1.6$ and $e_n \approx 2.8$. Mention that the obtained by us value of e_n agrees with the experimental results [6, 7], considered together with theoretical calculations performed by us for the $6^+_1 \to 4^+_1$ transition in ^{102}Sn [2].

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