

Impurity effects in Lambda hypernuclei

Masahiro Isaka¹

¹ RIKEN Nishina Center, RIKEN, Wako, Saitama 351-0198, Japan.

One of the unique and interesting aspects of hypernuclei is structure change due to the addition of a Λ particle as an impurity. Since a Λ particle is unaffected by the nuclear Pauli principle in hypernuclei, it can penetrate into nuclear interior and modify nuclear structure through the interactions between the Λ and nucleons. So far, experimental and theoretical studies have revealed a couple of interesting structure changes in p -shell Λ hypernuclei.

Now, it is expected that the forthcoming (and on-going) experiments at J-PARC and JLab, *etc.* enable us to obtain structure information of heavier Λ hypernuclei. Particularly, it is of interest to reveal structure changes in p - sd shell and neutron-rich Λ hypernuclei, because the corresponding core nuclei have various structures in the ground and low-energy regions. For example, it has been discussed that Be isotopes have the exotic structures associated with the 2α clustering near the ground states. In a typical sd -shell nucleus ^{20}Ne , deformed mean-field like and $\alpha + ^{16}\text{O}$ cluster structures coexist in the same energy region. In sd -shell regions, various deformations also appear in the ground-state regions. For instance, Mg isotopes such as ^{24}Mg and ^{26}Mg are the candidates of triaxial deformed nuclei. Therefore, it is expected that the addition of a Λ particle to these nuclei causes various structure changes.

To investigate such phenomena, we have extended the antisymmetrized molecular dynamics (AMD) model to Λ hypernuclei [1] and applied it to several p - sd shell Λ hypernuclei. In neutron-rich $^1_{\Lambda}\text{Be}$, it has been predicted that the ground-state parity of ^{11}Be is reverted by a Λ particle [2]. In $^2_{\Lambda}\text{Ne}$, it was found that a Λ particle largely reduces the intra-band $B(E2)$ values in the excited $\alpha + ^{16}\text{O} + \Lambda$ band than those in the ground band [3]. In this talk, we will show our recent results obtained by the AMD calculations for several p - sd shell and neutron-rich Λ hypernuclei such as Be, C, Ne and Mg, and discuss possible structure changes by a Λ particle.

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