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**Alpha inelastic scattering and cluster structures in light stable and unstable nuclei**

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Alpha particle clustering where four nucleons strongly correlate to constitute an alpha cluster is an important concept in nuclear physics. The alpha cluster behaves as a subunit of the atomic nucleus and exhibits characteristic phenomena which cannot be described by single-particle models like the shell model. Since the theoretical description of the clustering phenomena under the shell-model framework requires a huge number of single-particle bases, it is generally difficult to treat the clustering phenomena in the truncated shell-model space. It is widely known that the ground-state wave function by the SU (3) shell model is mathematically equivalent to that by the alpha cluster model. This means the alpha particles inherently exists even in the compact ground-state wave function although its alpha cluster structure is not fully developed. Thus, the spatially developed alpha-cluster states are expected to be excited by stimulating the relative motion between the alpha particles in the ground state. We recently proposed that the inelastic alpha scattering is a very useful probe to examine the alpha cluster structure. Since the alpha inelastic scattering selectively excites isoscalar natural-parity transitions, it is very suitable to excite the inter-cluster relative motion. We measured the cross sections for the alpha inelastic scattering from $^{11}$B, $^{12}$C, $^{13}$C, and $^{24}$Mg. The experiment was carried out by using a 400-MeV alpha beam at Research Center for Nuclear Physics, Osaka University. The experimental results were compared with the shell-model and cluster-model calculations, and the alpha-cluster structures in those nuclei were discussed. The present approach by means of the alpha inelastic scattering is very useful to examine the alpha-cluster structures in stable nuclei, and it should be naturally applied to unstable nuclei. In the present talk, the experimental details and results on the stable nuclei will be reported. Future prospects on the extended studies in unstable nuclei will be also discussed.