

# ALPHA-NUCLEUS INTERACTION POTENTIAL

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The parameters of the interaction potential between alpha-particle and nucleus are evaluated in the framework of unified model for alpha-decay and alpha-capture (UMADAC). The alpha-decay half-lives are evaluated in the framework of the cluster model using the WKB approximation. Both processes, alpha-decay and alpha-capture, are considered as penetration of the alpha-particle through the potential barrier formed by nuclear, Coulomb and centrifugal forces. The spins and the parities of parent and daughter nuclei, the quadrupole and hexadecapole deformations of daughter nuclei are taken into account at evaluation of the alpha-decay half-lives. The alpha-nucleus interaction potential is obtained by fitting experimental data for both the alpha-decay half-lives of 344 nuclei and the alpha-capture cross-sections of  $^{40}\text{Ca}$ ,  $^{44}\text{Ca}$ ,  $^{59}\text{Co}$ ,  $^{208}\text{Pb}$  and  $^{209}\text{Bi}$ .