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# Influences of the isospin-asymmetry and nuclear skin thickness on the structure and reactions of heavy nuclei

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The isospin-asymmetry and its related nuclear matter properties influence most of the nuclear structure, reactions and decays. For instance, the values of the density diffuseness in finite nuclei and its anisotropy and polarization, rely on the asymmetry characteristics of the nucleon-nucleon interaction and nuclear matter at sub-saturation densities. This is related to the allowed maximum isospin asymmetry value for bound asymmetric nuclear matter. Increasing the isospin-asymmetry within the surface and tail regions of the nucleus makes these regions more soft relative to the internal region, and this consequently increases its single-particle and collective dynamicity. This in turn affects its structure and its reactions with other nuclei. Detailed influences of the isospin asymmetry and its related neutron/proton skin thickness, and the symmetry energy coefficients of nuclear matter on the fusion reaction of nuclei and its α and cluster decays will be discussed.

## Section

Nuclear structure: theory and experiment

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