

# Structure of the Shape Isomers from Different Aspects

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The connection of the quadrupole deformation and clusterization is investigated on a semimicroscopic basis. Special attention is paid to the symmetry-aspects of the problem. In particular: i, super- (SD) and hyperdeformed (HD) states are determined from shape-selfconsistent Nilsson-model calculations, based on their quasidynamical SU(3) symmetries [1–6]; ii, their possible (binary or ternary) clusterizations are obtained from the SU(3) selection rule [1–9]; iii, the energetic preference of the clusterization is determined from different methods, including the double-folding calculations of dinuclear system model [2–4, 9]; iv, case studies are discussed, when the theoretical predictions (or descriptions) can be compared to experimental observations: SD state of  $^{28}\text{Si}$  [5],  $^{36}\text{Ar}$  [1, 2, 4, 10],  $^{40}\text{Ca}$  [6],  $^{56}\text{Ni}$  [3, 4], HD state of  $^{36}\text{Ar}$  [1, 2, 4, 10], and  $^{40}\text{Ca}$  [6, 9].

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