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Competition Between Single-Particle and Collective Excitations in the Region of $30 \leq Z \leq 38$ and $32 \leq N \leq 50$[1] S.L. RICE, Y.Y. SHARON, G.J. KUMBARTZKI, N. BENCZER-KOLLER, Rutgers University — The experimental data for the excitation energies and B(E2) reduced transition probabilities for the 2_1^+, 4_1^+ and 2_2^+ states in the long chains of stable and radioactive even-even isotopes of Zn, Ge, Se, Kr and Sr were examined in terms of the competition between single-particle and collective modes of excitation. The magic numbers of 28 and 50 were used for both protons and neutrons. While the level-energy information is not particularly infomative when plotted as a function of the neutron number N, the B(E2) values showed obvious trends towards collectivity as Z increases towards the middle of the shell. The data were also analyzed as a function of the number of protons (proton holes) N_p and neutrons (neutron holes) N_n in the valence shells and of the parameter $P = \frac{N_p N_n}{N_p + N_n}$. Increasing values of P correspond overall to larger B(E2)'s but the scatter of the data indicates structures with complex wave functions.

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