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Microscopic-macroscopic method for studying single-particle level density of superheavy nuclei

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The shell structure of heavy nuclei with Z > 104, which can be produced in the actinide-based complete fusion reactions, is studied with modied two-center shell model. Using microscopic-macroscopic approach, the mass excesses and Q_alpha - values are calculated and compared with available experimental data. The predicted properties of superheavy nuclei show that the next doubly magic nucleus beyond 208 Pb is at Z >= 120. It is shown that the production cross sections of new superheavy nuclei decisively depend on the position of proton shell closure.

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