

Description of the Spectroscopic Properties of ^{26}Si

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We are interested in our work to the study of the spectroscopic properties, complete energy spectrum and electromagnetic transitions, of the ^{26}Si in the framework of the shell model using the PSDPF interaction.

Silicon has a significant astrophysical interest, which plays a crucial role in the comprehension of nucleosynthesis, especially, the galactic chemical evolution. The ^{26}Si isotope is important for determining the $^{25}\text{Al}(p,\gamma)^{26}\text{Si}$ reaction rate. The calculation of the reaction rate involves the determination of the spin/parity level assignments, especially those at high energies, above the proton threshold. As ^{26}Si has $N < Z$, we make assignments based on known levels in the mirror nucleus ^{26}Mg .

We will present a detailed comparison between the shell model predictions obtained by PSDPF for the mirrors, ^{26}Si and ^{26}Mg , and the experimental available data. Calculated reaction rate of the $^{25}\text{Al}(p,\gamma)^{26}\text{Si}$ reaction will be as well discussed.