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The $^3\mathrm{H}(\alpha, \gamma)^7\mathrm{Li}$ and $^3\mathrm{He}(\alpha, \gamma)^7\mathrm{Be}$ radiative capture reactions at low and intermediate energies

In this work, the $^3\mathrm{H}(\alpha, \gamma)^7\mathrm{Li}$ and $^3\mathrm{He}(\alpha, \gamma)^7\mathrm{Be}$ mirror radiative capture reactions that are of interest to nuclear astrophysics are considered from the microscopic viewpoint within the multiscale algebraic version of the resonating group model [1]. The total and partial astrophysical S factors for these reactions as well as the nuclear phase shifts of elastic scattering of the nuclei colliding in the entrance channels are calculated at low and intermediate energies covering the low-lying resonances of the final fused nuclei. Electromagnetic properties of the bound states of these nuclei along with the properties of their low-lying resonance states are also computed. A comparison of the calculated results with data obtained from experiments is performed.

[1] A. S. Solovyev, S. Yu. Igashov, Phys. Rev. C **96**, 064605 (2017).

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