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Spectroscopic Factors of Mirror Nuclei SHI CHUN SU, Chinese University of Hong Kong — Neutron spectroscopic factors have been extracted from all measured excited states of ³⁶Cl, ²⁷Mg, ³⁵S and ³¹Si. These nuclei were chosen because of the availability of the (d,p) transfer reaction data and the astrophysical interest in the corresponding mirror nuclei (³⁶Ca, ²⁷P, ³⁵K and ³¹Cl). These latter four nuclei are important in the evolution theory of neutron stars. Since no SFs for these four nuclei are available experimentally, shell model is used to calculate them. To assess the uncertainties of the calculated SFs, we compare the experimental SF values to the calculated values from Oxbash. Three different interactions (USD, USDA and USDB) for sd shell nuclei are used. USDA and USDB are new interactions developed recently. The results from the three interactions agree to within 20% when the experimental SFs are larger than 0.02. However, for SFs, as small as 0.003, good agreements can only be achieved with the new USDB interaction. The present work lowers substantially the validity limit of the shell model SFs calculations for the sd nuclei. It also quantifies the uncertainties of the calculated SF's. These theoretical uncertainties will be important to assess the outputs of the network calculations for evolution theory of neutron star.

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