

Theoretical oscillator strengths for the Sc I

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The atomic transition probabilities and also oscillator strengths are very important fundamental parameters in the fields of atomic spectroscopy, astronomy. In particular, accurate oscillator strengths are necessary for the determination of the elemental abundances in stars. Scandium (Sc) is apparently a much more abundant element in the sun and certain stars than on earth. It is one of the elements with only one stable isotope. This isotope has the mass number 45 and nuclear spin $I = 7/2$ [1].

The electric dipole transition probabilities and the oscillator strengths of neutral Scandium have been calculated using the Cowan code [2] and the quantum defect orbital (QDO) theory [3] for the wavelength region from 400 nm to 580 nm. The transition probability and the oscillator strength results obtained in this work are mostly in agreement with the data obtained from different theoretical methods given in the literature [4, 5, 6]. In this study, 24 transition probabilities have been given for the first time.

References

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