ELECTRON EXCITATION CROSS SECTIONS FOR THE S II TRANSITIONS 

3s^23p^3^S \rightarrow 3s^23p^3^P^o, 3s^23p^3^P^o and 3s^23p^4^P

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Experimental excitation cross sections are reported for the transitions 3s^23p^4^S \rightarrow 3s^23p^3^P^o, 3s^23p^3^P^o and 3s^23p^4^P in S II. Use is made of electron energy-loss and merged-beams methods. The transition wavelengths (energies) are \( \lambda = 6731 \, \text{Å} \) (1.844 eV), \( \lambda = 4076 \, \text{Å} \) (3.04 eV), and \( \lambda = 1256 \, \text{Å} \) (9.866 eV), respectively.

The energy ranges covered extend from below the thresholds of each transition to approximately 4 times threshold. As in previous work with O II [11], care was taken to assess and minimize the metastable fraction in the S II beam. All data were collected with individual dead-time corrections applied to each of the four ion and electron beam modulation phases. All inelastically-back-scattered electrons were collected with the use of an electrostatic mirror placed in the merged beams axis. The mirror will be described in detail.

Comparison is made between present experiments and 6-state R-Matrix calculations [2], [3] and 12-state R-Matrix calculations [4] for each transition.

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References


