

POTENTIAL ELECTRON  
SCATTERING BY PHOSPHORUS ATOM

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S u m m a r y

Elastic scattering of electrons by phosphorus atoms within the collision energy range of 0.01–200 eV has been studied theoretically for the first time. The integral and differential cross sections are calculated in the spin-polarized approximation for a parameter-free real optical potential. The total and spin electron densities, the electrostatic potential, and the spin exchange and correlation-polarization potentials are found for the phosphorus atom in the local spin density approximation of the density functional theory. The features of the integral cross section at energies lower than 10 eV are studied in detail in various approximations and compared with the data for neighbor sulfur, chlorine, and argon atoms. The spin exchange asymmetry in the electron scattering by the phosphorus atom with a half-filled valence  $3p^3$ -subshell was studied with regard for the spin dependence of the exchange and polarization interactions.