The Spherical Geometric Model of Absorbed Particles: Application to the Electron Transport Study

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Abstract : The mean penetration depth has a most important in the absorption transport phenomena. Analytical model of light ion backscattering coefficients from solid targets have been made by Vicanek and Urbassek. In the present work, we showed a mathematical expression (deterministic model) for $Z_{1/2}$. In advantage, in the best of our knowledge, relatively only one analytical model exit for electron or positron mean penetration depth in solid targets. In this work, we have presented a simple geometric spherical model of absorbed particles based on CSDA scheme. In advantage, we have showed an analytical expression of the mean penetration depth by combination between our model and the Vicanek and Urbassek theory. For this, we have used the Relativistic Partial Wave Expansion Method (RPWEM) and the optical dielectric model to calculate the elastic cross sections and the ranges respectively. Good agreement was found with the experimental and theoretical data.

Keywords : Bentabet spherical geometric model, continuous slowing down approximation, stopping powers, ranges, mean penetration depth

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020