

Investigated optical studies of Si quantum dot

Abstract

Further study of the quantum dot potential for Si is presented. This potential has been calculated by means of our recent empirical model. The indirect energy gap (Γ -X) is calculated using the full potential-linearized augmented plane wave (FP-LAPW) method. The Engel-Vosko generalized gradient approximation (EV-GGA) formalism is used to optimize the corresponding potential for energetic transition and optical properties calculations of Si. The refractive index and transverse effective charge are predicted as a function of dot diameter that is in turn used to test the validity of our model. The obtained results show a reasonable agreement in comparison with experimental data and theoretical results.