INFLUENCE OF POLARIZATION INTERACTION ON THE EXCITON ENERGY SPECTRUM IN SEMICONDUCTOR NANOCRYSTALS

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S u m m a r y

A theory of the exciton energy spectrum in a semiconductor spherical nanocrystal (SN) is developed under the conditions where the dominant role is played by polarization interaction of an electron and a hole with the SN-dielectric matrix interface. A new modified effective mass approximation used for the description of the exciton energy spectrum in a semiconductor SN with radii a comparable to the Bohr radius of the exciton a_{ex}^0 is proposed. It is shown that, in the framework of the model simulating SN as an infinite-depth potential well, the effective mass approximation can be used for the description of exciton states in SNs with radii $a \approx a_{\text{ex}}^0$ considering that the reduced mass of the exciton μ represents a function of the SN radius a.