Excited-state relaxation in PbSe quantum dots

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(2 200 2 200 2 200)

( ). (≤1)

1

2046 211 260 24 $P\rightarrow S$ $P\rightarrow S$.

[| 10.1063/1.2 01022]

INTRODUCTION

[1] [2]
Δ
Δ [. 1( )].
[. 1( )],
Δ
radiative
[3]
Δ [4]
[5,6]

( ) (. 10)
[*S* *P*
. 1( )] 200 400 100 300 ~30 (.
11) [3,11,12]
(~50)
(~30). [13 16] / [5,6]
[1]
[4,5]
[. 1( )].

(L,

R,

$$V(\mathbf{r}) \quad \sum_{\alpha} \sum_{\mathbf{R}} v_{\alpha}(|\mathbf{r} \quad \mathbf{R} \quad \mathbf{d}_{\alpha}|). \tag{4}$$

( ) *bulk*

(. 36) ~0.5

( ) *L*-

( ) [40]

. [40]

L

(*R* 15.3) [260] [24]

[2046] [211] (*R* 30.6). [10]

[10]

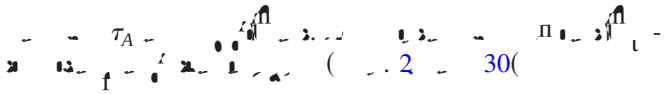
(2),

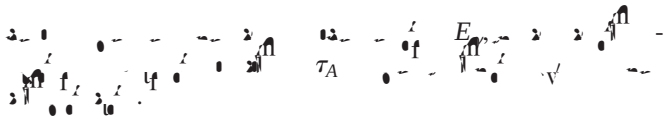
$$\epsilon^{-1}(\mathbf{r}_1,\mathbf{r}_2) \quad \epsilon_{\iota}^{-1}(\mathbf{r}_1,\mathbf{r}_2) + [\epsilon_{\iota}^{-1}(\mathbf{r}_1,\mathbf{r}_2) \quad \epsilon_{\iota}^{-1}(\mathbf{r}_1,\mathbf{r}_2)]m(\mathbf{r}_1)m(\mathbf{r}_2), \tag{5}$$

$m(\mathbf{r})$ 1 $|\mathbf{r}| \leq R$ d (, d 1),

$\sqrt{[\ (\pi(R \quad |\mathbf{r}|)/2d)+1]/2}$ R d $R+d$,

e_p e_s
(≥130
$\sim \hbar\omega$)





SUMMARY