

Lifetime and polarization of the radiative decay of excitons, biexcitons, and trions in CdSe nanocrystal quantum dots

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(X): (XX) ~1:1 (R=19.2). T
 2 (R=10.3). () T
 2

(X⁺): (X)

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I. INTRODUCTION

Of (NQD) X (,
 , -), X⁺ (-2) X (2 -),
 XX (2 -2), (F . 1). P
 1 XX C S NQD
 , -100-
 ad at A, ~20
 ad at X. F A
 2 X⁺, X, XX C S NQD .

$$(XX) \quad (X^+ \quad X).$$

II. METHOD

$R=10.3, 14.6,$ C S , z
 19.2 , -
 .7 T -
 , , ,
 T , , R .8 9.
 (LDA) , , -
 LDA S , , . T -
 , () - , . T -
 , S , v,c -
 - , (c)

$$\left(\frac{1}{\lambda}\right) = \frac{4 F^3}{3c^2} |M|^2, \quad (2)$$

(, = 2 , F=3 / (NQD+2) , NQD , NQD),
 c , , -460.8 -460.8 -4 6460.8 T 6460 -60.110 T 6460 -60.110 08302655.14.0132T T/F21T

$$E^{(SP+C)} = \left(\frac{E^{(SP)}}{E^{(SP+C)}} \right)^3 E^{(SP)}, \quad (5)$$

$$f_{SP} = f_{SP+C} \quad (\text{LMT 1})$$

$$f_{+C} = f_{+C} \quad (\text{LMT 2}), \quad . T , ,$$

2. a [F. 4()]. T
[$N_V=3$ $N_C=1$ E. (1)]
X. T

' , .¹⁹T , , , -
 , - , , -
 , , 75% (R . 19). I -
 , , 9,14 C S NQD ,
 - , da ,
 () b t (F . 1()).
 T (25 30
) 28 /F41. - 0.3 .56TD - 17. /-

,¹⁹ 83TD62095414001 9T 0001 0.50010TD,T 001 0.250TD0.0001T 14T 9.9701 0.5011T 0.00014T001 0.250TD0.000

F. Trions

I , , ,
 F . 1() , . T X⁺ [N=3
 (1 2),
 (1 1 1),
 (1 1 1 1), X⁺ (N=3) ,
 (1 1 1 2). R N=1, . . . ,
 T F . 1() - , X [N=3
 (2 1) 284 0 924.919 0 TD.0.984 0 0 .984T. -t ~~it~~ at 84T. TDa T 9.T.T.T
 (2 1) . T (2 1)]