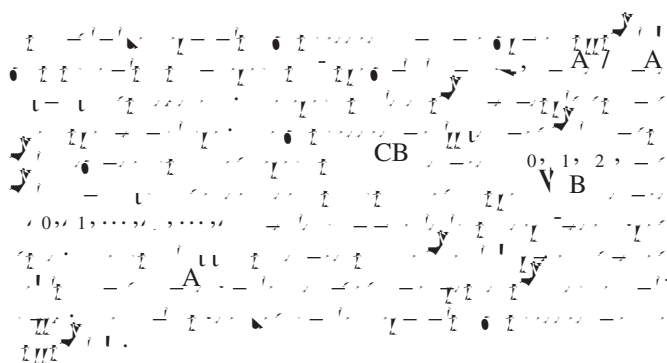


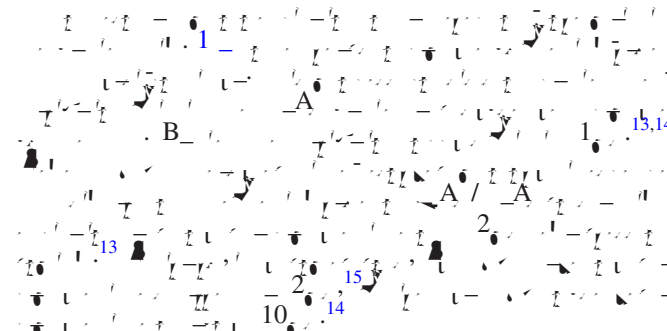
Carrier relaxation mechanisms in self-assembled (In,Ga)As/GaAs quantum dots: Efficient $P \rightarrow S$ Auger relaxation of electrons

A. ^{*} B. A.
 8 2006; 1 A. 2006

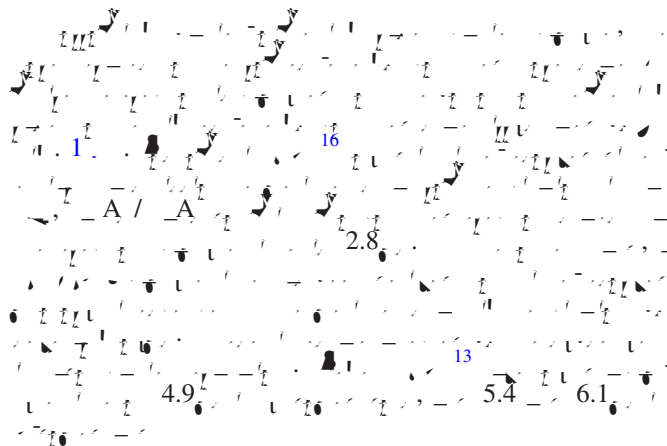
A / A
 A / A
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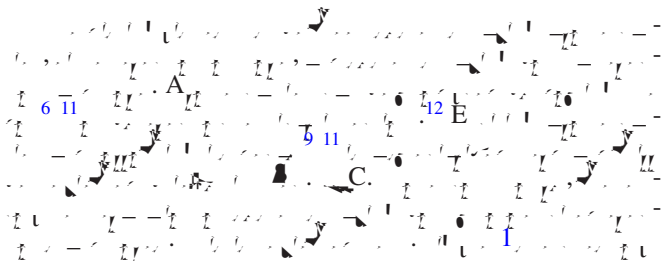
A. Barrier-to-wetting layer carrier capture



B. Carrier capture from the wetting layer into the dot

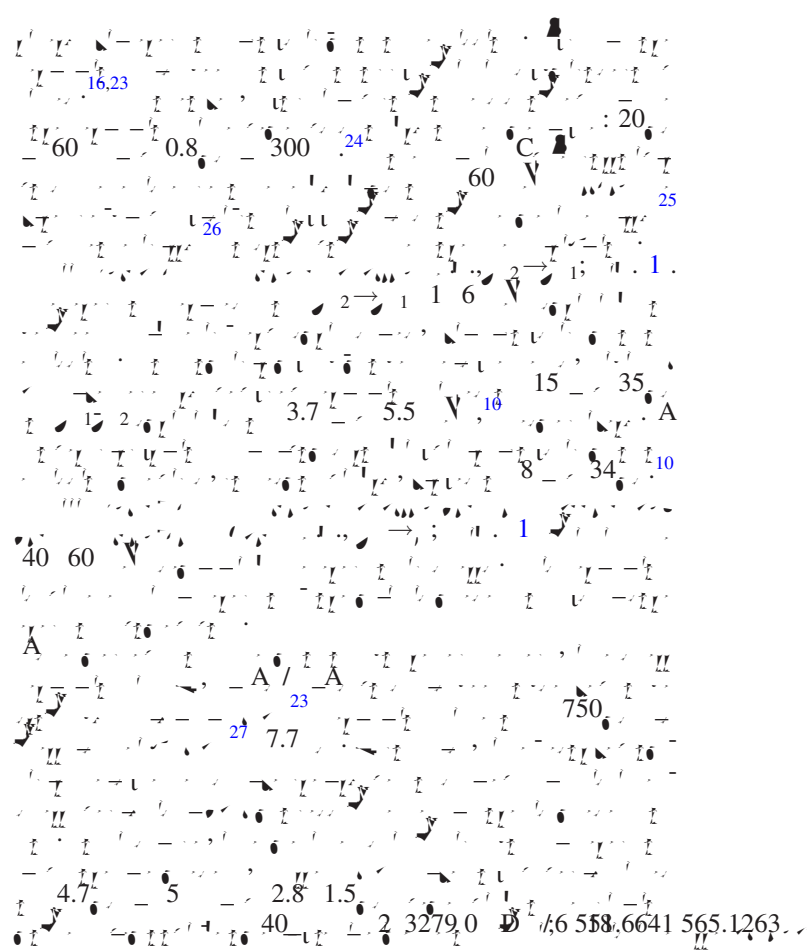


II. CHARACTERISTIC DYNAMICAL PROCESSES OF EXCITED ELECTRONS AND HOLES IN SELF-ASSEMBLED (In,Ga)As/GaAs QUANTUM DOTS



C. Relaxation of excited carriers within the dot

The relaxation of excited carriers within the dot is studied by measuring the time-resolved photoluminescence (TR-PL) decay curves. The decay curves are fitted with a single exponential function, and the decay time constant τ is extracted. The decay time constant τ is found to be independent of the excitation intensity, indicating that the decay is dominated by a single process. The decay time constant τ is found to be in the range of 100 ps to 1 ns, depending on the excitation energy. The decay time constant τ is found to increase with increasing excitation energy, indicating that the decay is dominated by a process that becomes more efficient at higher excitation energies. The decay time constant τ is found to be independent of the dot size, indicating that the decay is dominated by a process that is not sensitive to the dot size. The decay time constant τ is found to be independent of the dot shape, indicating that the decay is dominated by a process that is not sensitive to the dot shape. The decay time constant τ is found to be independent of the dot material, indicating that the decay is dominated by a process that is not sensitive to the dot material.



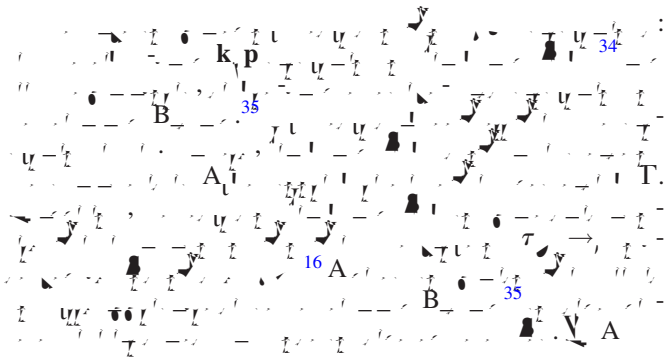
32 A 33 36
37 40 A

$R_{,a}^y$ 52
E ψ B
k R A A
k e: 53

$$\frac{y}{x} = \frac{1}{2} \Rightarrow y = \frac{1}{2}x$$

Figure 1: Energy band structure of (In,Ga)As/GaAs dots. The plot shows energy levels (e.g., Γ_6 , Γ_8 , Γ_7) and their corresponding wave functions. The energy axis is in eV, and the momentum axis is in Å^{-1} .

D. Comparison to other calculations for (In,Ga)As/GaAs dots



⁸E. A. ... A. D. A. ... C. ... E. A. ... 26, 105 2005.

⁹E. A. ... B. ... D. A. C. ... C. ... B 70, 16T305 2004.

¹⁰E. A. ... B. ... D. A. C. ...