Electron and hole addition energies in PbSe quantum dots

I. INTRODUCTION

$$( ) \quad \sum \varepsilon \quad -\sum [\quad] \qquad ( )$$

w ε ( ) ( ) f f f

$$\sum_{\sigma} \int \psi^{*}(\mathbf{r}\ \sigma)\psi(\mathbf{r}\ \sigma)\Phi(\mathbf{r})\ \mathbf{r} \qquad ( )$$

w $\{\psi(\mathbf{r}\ \sigma)\}$ w f $\mathbf{r}$ $\sigma)$ $\Phi(\mathbf{r})$ f

$$\varepsilon(\mathbf{r})\nabla\ \Phi(\mathbf{r}) \quad \pi \sum_{\sigma} \psi^{*}(\mathbf{r}\ \sigma)\psi(\mathbf{r}\ \sigma) \qquad ( )$$

$\varepsilon(\mathbf{r})$ f y ( ) w

$$( ) \quad \sum \Sigma \quad -\sum [\quad] \qquad ( )$$

w Σ f f y f ( ) f f w f y f f y y y

$$\Sigma \quad \sum_{\sigma} \int |\psi(\mathbf{r}\ \sigma)|\ \Sigma(\mathbf{r})\ \mathbf{r} \qquad ( )$$

w $\Sigma(\mathbf{r})$ f

$$\Sigma(\mathbf{r}) \quad - \quad \{ \quad (\mathbf{r}\ \mathbf{r}'). \quad (\mathbf{r}\ \mathbf{r}')\} \qquad ( )$$

$(\mathbf{r}\ \mathbf{r}')$ f $\mathbf{r}$ $\mathbf{r}'$

C. Quasiparticle band gap

B. Charge distribution of the injected carriers

C. Charging spectrum and addition energies

s s f Δ( ) s y s
(f

V. SUMMARY

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