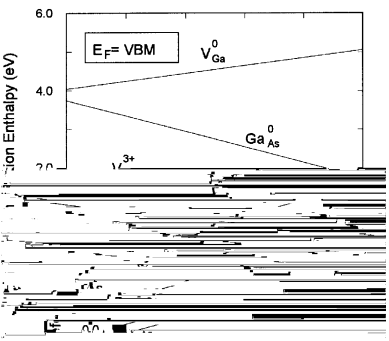
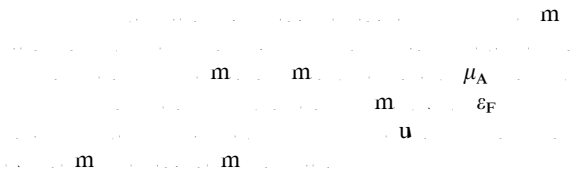


() () u m m
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 m²¹ m⁻³)
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2. μ_{Ga} vs μ_{As}



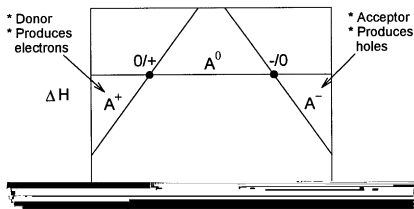
2.1. μ_{Ga} vs μ_{As}

m u
 m m m
 m u m
 m " u
 " μ_A m u
 $\Delta H(^0) = E_o(^0) - E_o(.) + \mu_A$ ()

$E_o(^0)$
 u $E_o(.)$
 u
 u m
 u m
 (A)
 (Ga)
 (Ga) m u m
 m m m m

2.2. μ_{Ga} vs μ_{As}

m u
 m ϵ_F m
 m



$$(\Delta H) = \epsilon(\text{donor}) - \epsilon_F$$

$$\Delta H(\text{donor}) = \Delta H(\text{neutral}) - \epsilon(\text{donor}) + \epsilon_F$$

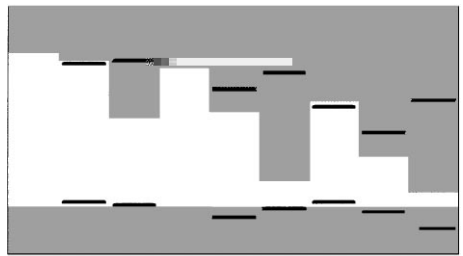
$$\Delta H(\text{acceptor}) = \Delta H(\text{neutral}) + \epsilon(\text{acceptor}) - \epsilon_F$$

$$\Delta H(\text{acceptor}) = \Delta H(\text{neutral}) + \epsilon(\text{acceptor}) - \epsilon_F$$

$$\Delta H(\text{donor}) = \Delta H(\text{neutral}) - \epsilon(\text{donor}) + \epsilon_F$$

) u m m u m u
 m m m u u
 u u m u
 m " m m u"
 mm u m
 u u ff
 m u
 u
 m m m ()
 (1 u () (m) () u

1*/



AlSb GaP InP AlAs GaAs InAs AlSb

"uu m u" (

) u m u m m
 u u u

$$\varepsilon(+ -) \varepsilon_{\text{pin}}^{(n)}$$

$$\varepsilon_F = \varepsilon_{\text{pin}}^{(n)} = \varepsilon(+ -) \quad ()$$

$$\begin{aligned} & m \quad \varepsilon_{\text{pin}}^{(n)} \quad u \\ & \text{ff} \quad m \quad u \\ & \varepsilon_{\text{pin}}^{(n)} \quad uu \quad m \quad u \quad \varepsilon_{\text{pin}}^{(n)} \\ & m \quad u \quad () \quad u \quad u \quad \text{ff} \end{aligned}$$

“ ”

$$\begin{aligned} & u \quad () \quad “ \\ & ” \quad () \quad m \quad m \\ & m \quad m \quad u \quad m \\ & m \quad m \quad m \\ & m \quad m \quad u \\ & m \quad “ \quad u \quad ” \\ & u \quad u \quad m \\ & m \quad m \quad m \\ & (\quad \quad \quad 2 \quad) \\ & m \quad m \quad u \quad u \quad u \\ & u \quad u \\ & m \quad u \end{aligned}$$

$$\begin{aligned} & () \quad u \quad m \quad m \\ & m \quad m \quad u \\ & \varepsilon_{\text{pin}}^{(p)} \quad u \\ & m \quad m \quad \varepsilon_{\text{pin}}^{(p)} \\ & m \quad \varepsilon_{\text{VBM}} \quad u \\ & m \quad u \quad u \quad m \\ & uu \quad m \quad (\quad u \quad u \quad) \\ & () “ ” u \quad m \quad m \quad m \\ & u \quad u \quad m \quad u \quad u \\ & m \quad m \quad m \quad m \\ & u \quad m \quad m \\ & (\quad \quad \quad ()) \quad m \\ & u \quad m \quad u \quad m \\ & u \quad m \quad m \quad “ \\ & m \quad u \quad ” \end{aligned}$$

“ ”

$$u \quad m \quad u$$

“ ”

$$\begin{aligned} & \text{ff} \quad u \quad u \quad u \\ & () \\ & u \quad u \end{aligned}$$

()