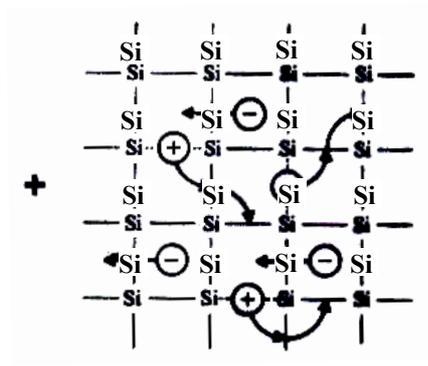


الباب العاشر
أشباه الموصلات

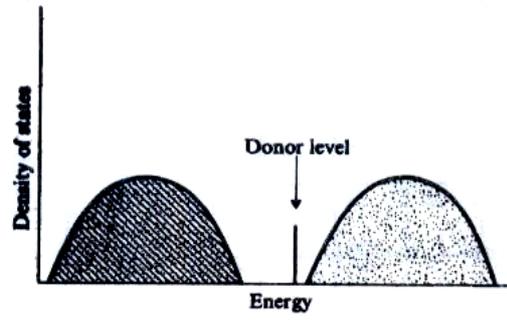
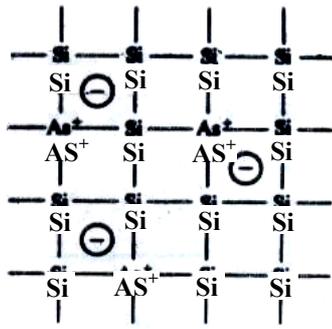
الباب العاشر
أشباه الموصلات

$$10^{23} \quad 5 \times 10^7 \quad 5 \text{ cm}$$

$$E_g \quad e^{-E_g/RT}$$

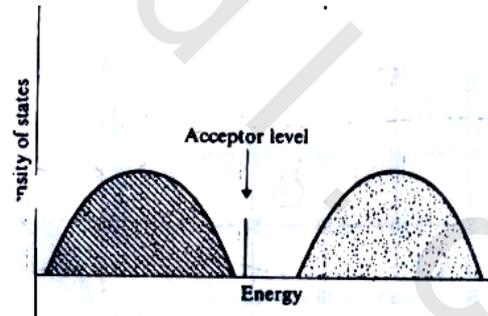
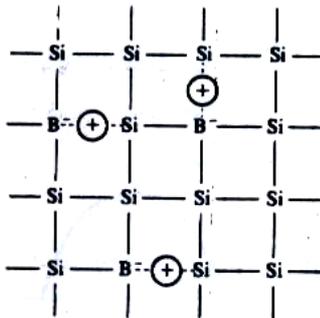


n-type Semiconductor



+1

positive semiconductor

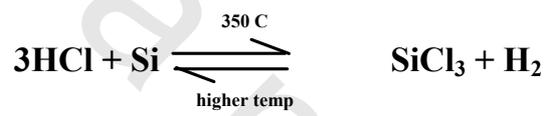
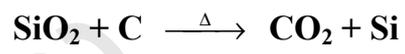


%98

1800

20

trichlorosilane



one

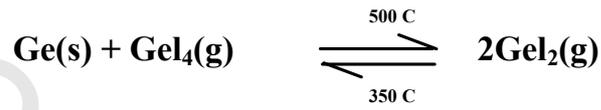
refining

500

350

Steady state

. Ge_2 Ge_4



(dopants)

فجوات الحزم :

ev0.044

	E_g , eV (0 K)		E_g , eV (0 K)
α -Sn	0.0	CdTe	1.6
InSb	0.2	Se	1.8
PbTe	0.2	Cu ₂ O	2.2
Te	0.3	InN	2.4
PbS	0.3	CdS	2.6
InAs	0.4	ZnSe	2.8
ZnSb	0.6	GaP	2.88
Ge	0.7	ZnO	3.4
GaSb	0.8	SrTiO ₃	3.4
Si	1.1	ZnS	3.9
InP	1.3	AlN	4.6
GaAs	1.5	Diamond	5.4
		BP	6.0

. ev0.057

. ev1.1

: Defect semiconductors أشباه الموصلات المختلفة

. nonstoichiometric

-TiO LiH KCl NaCl :

x MY_{1-x}

F

. Fcenters F

$M_{1+x}Y$

Fe_2O_3 Cr_2O_3 CdO ZnO

$M_{1-x}Y$

FeS

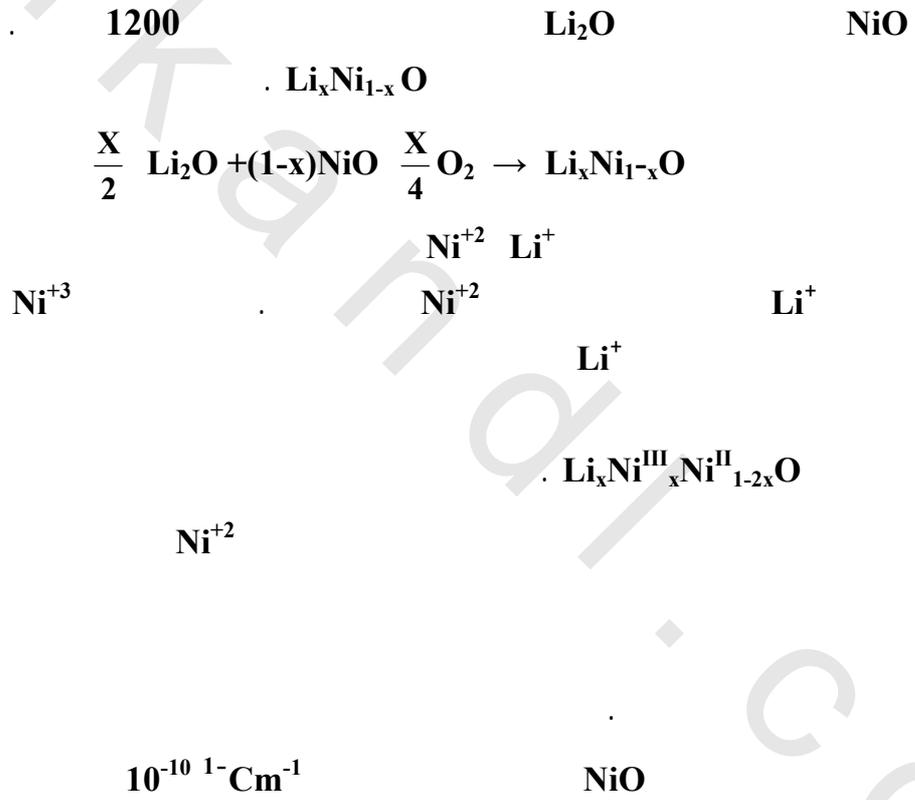
. CuI $S-TiO$ NiO FeO Cu_2O

$Fe_{0.95}O$

. $Fe^{II}_{0.85}Fe^{III}_{0.10}O$

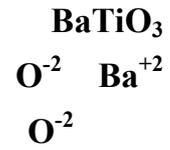
أشباه موصلات التكافؤ الموجه :

Controlled – Valence Semiconductors :

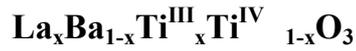


10%
 $.1^{-1} \text{Cm}^{-1}$

ccp :



Ti^{+4}



$\text{Ti}^{+3} \quad \text{Ti}^{+4}$



تطبيقات :

insulated-

rectifier

Photovoltaic cell

gate-field-effect transistor

الخلية الفوتوفولتائية :

الترانزستور المعزول :

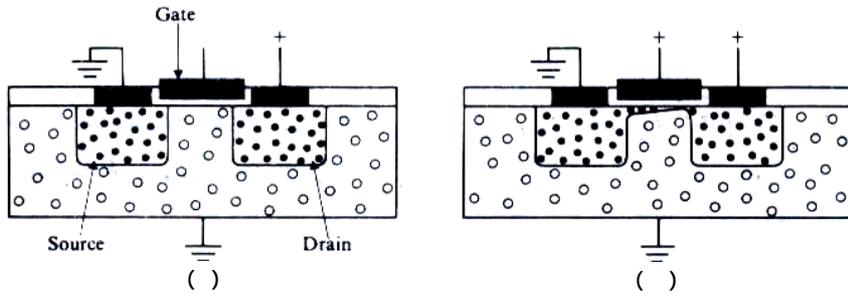
Metal(S) Semiconductoor (M)

[Mos]

(O) Oxide

(Vg) gate voltage

drain



. Mos

(" " ")

Mos

()

()

* * *

"الأسئلة"

- 1
- $\text{Li}_x\text{Ni}_{1-x}\text{O}$ -2
- ($\text{Li}_x\text{Fe}_y\text{Ni}_{1-x-y}\text{O}$)
- () -3
- GaAs ()
- InAs ()
- In
- x KCl ()
- $\text{Li}_{0.05}\text{Cu}_{0.95}\text{O}$ ()
- WO_2 2,999 () -4
- :
- NaHCO_3 CuZn CdS AlF BiP₄ Na_{0.5} WO₃ Os CeS LnP
- : -5
- As 0.1 ()
- A1 0.05,As 0.1 ()
- A1 0.01,As 0.1 ()
- A1 1 ()
- : -6

* * *