

Slides
Condensed Matter Physics
Lecture 16



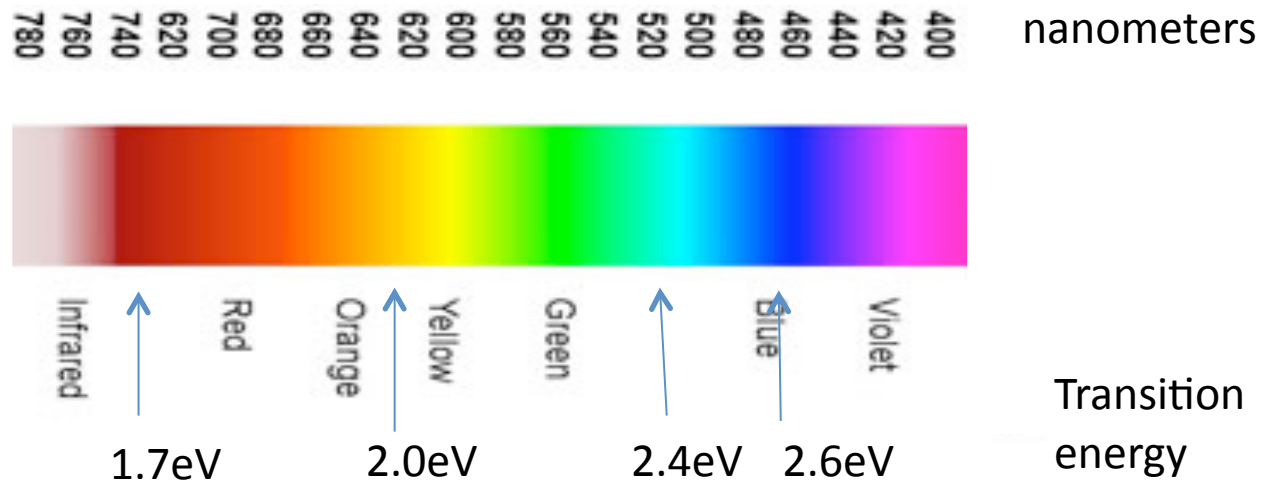
Cinnabar (HgS)
Gap = 2.0 eV



Realgar (As_4S_4)
Gap = 2.4 eV



Sulfur
Gap = 2.6 eV





Hope Diamond (Blue)
Roughly 1 Boron impurity per 10^7 carbon.
Estimated current value = 250 Million \$

Tiffany Diamond (Yellow)
Roughly 1 Nitrogen impurity per 10^6 carbon.

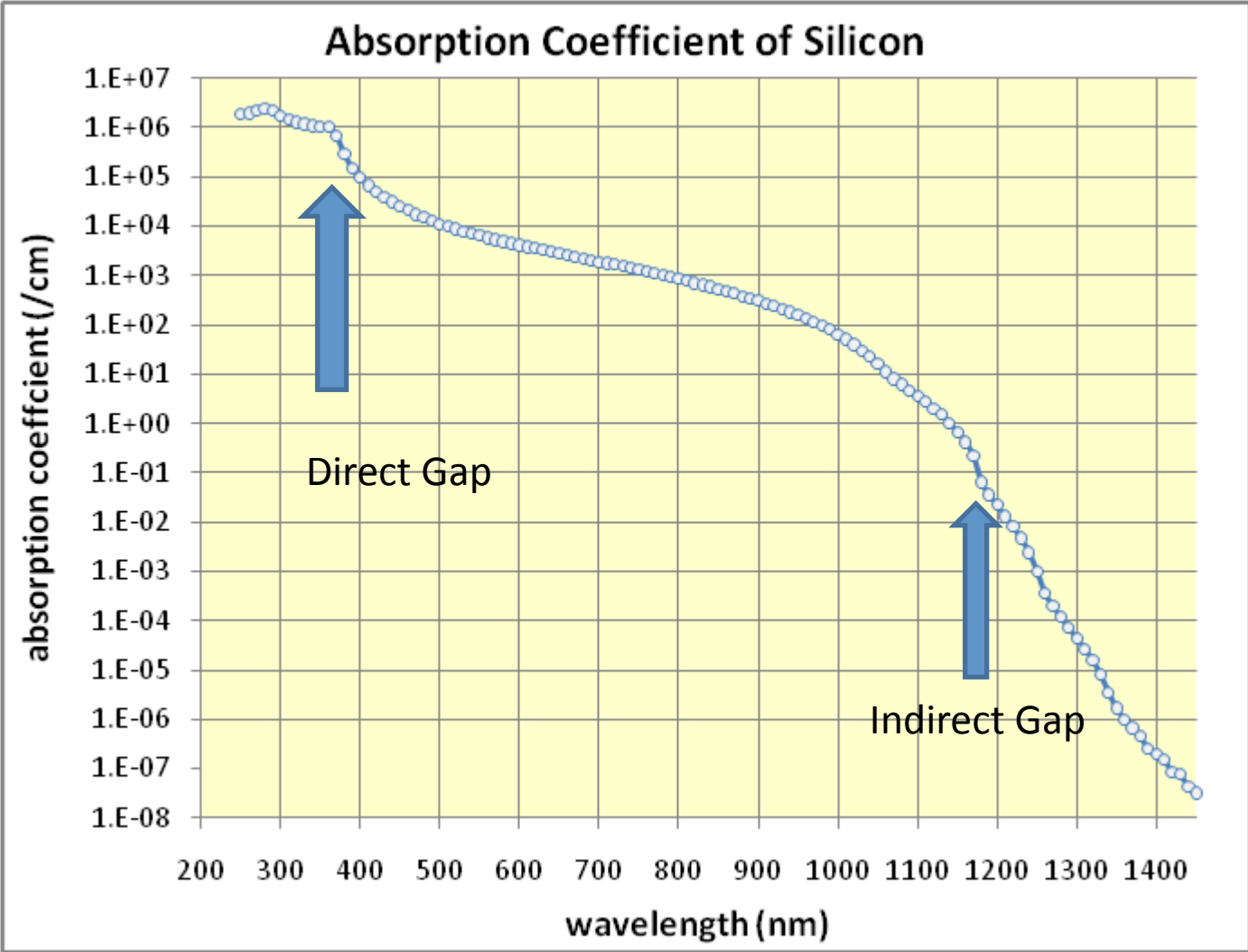
Estimated value 12 Million\$ (1983)



Synthetic Diamonds =

“Cheap” and any impurities
you want. (this example is
clear meaning no impurities)







Freshly cut sodium

Periodic Table of the Elements

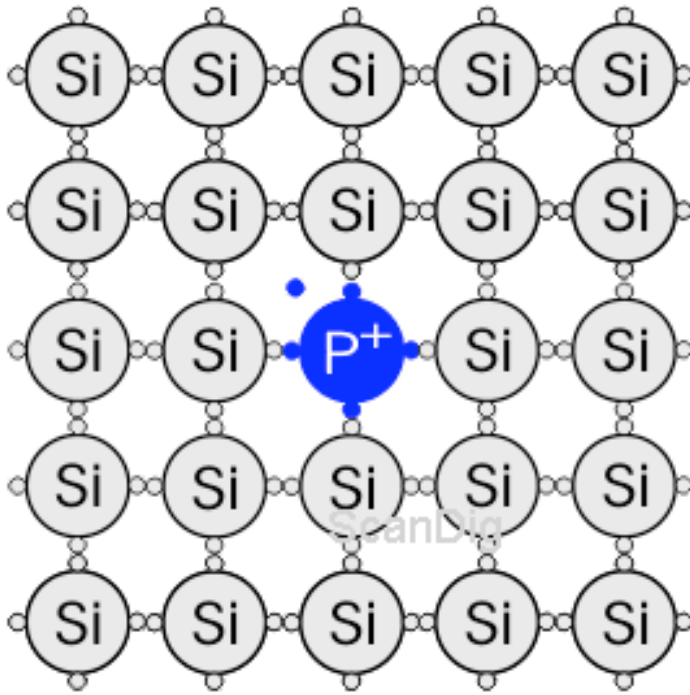
	IA																		0						
1	1 H																		2 He						
2	3 Li	IIA	4 Be																5 B	6 C	7 N	8 O	9 F	10 Ne	
3	11 Na		12 Mg	IIIB	IVB	VB	VIB	VII B	— VII —	IB	IB	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar								
4	19 K	20 Ca	21 Sc	22 Ti	23 Y	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr							
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe							
6	55 Cs	56 Ba	57 *La	72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn							
7	87 Fr	88 Ra	89 +Ac	104 Rf	105 Ha	106 Sg	107 Ns	108 Hs	109 Mt	110	111	112	113												

* Lanthanide Series

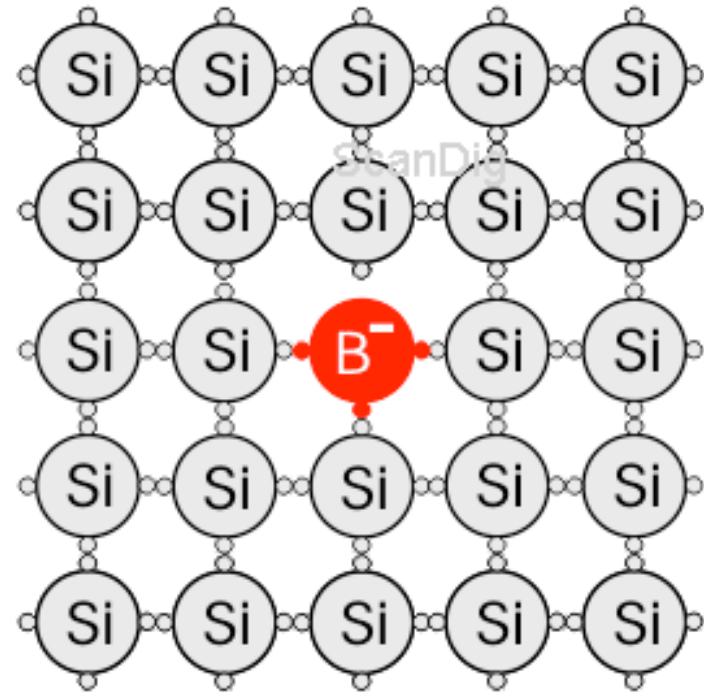
58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
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+ Actinide Series

90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr
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n-doping



p-doping