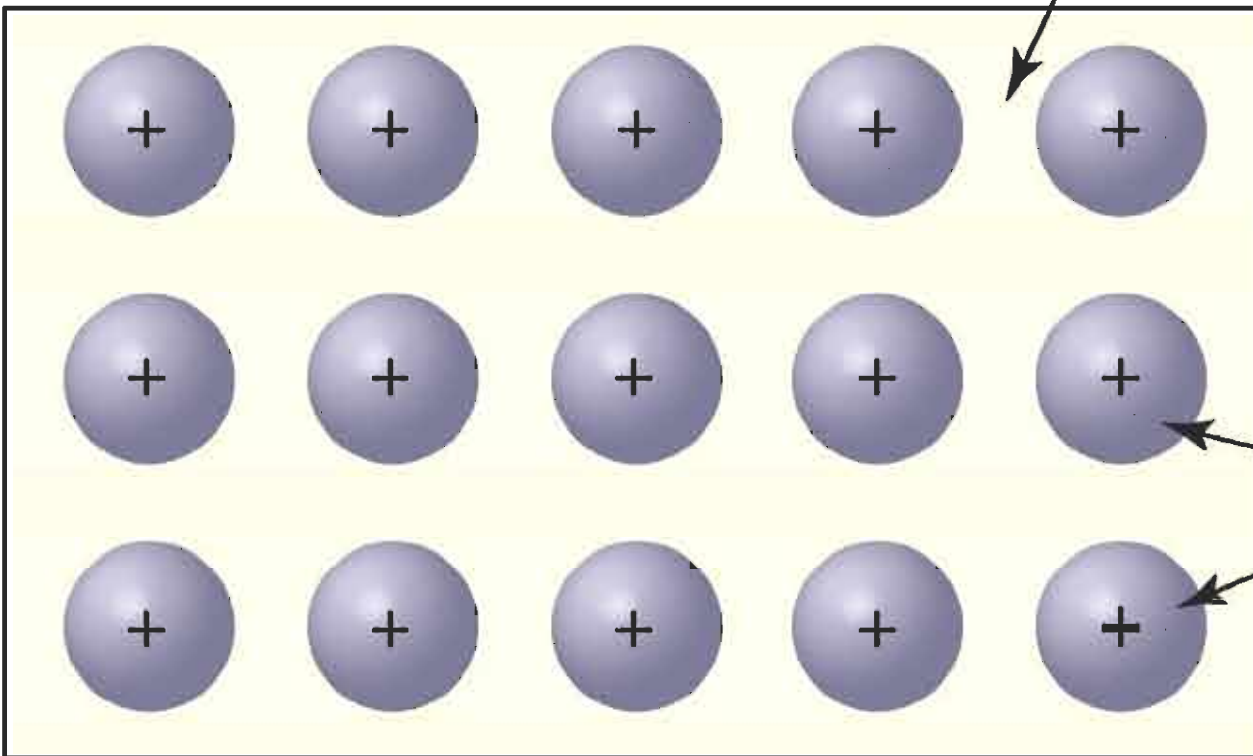


*Welcome to 3.091*

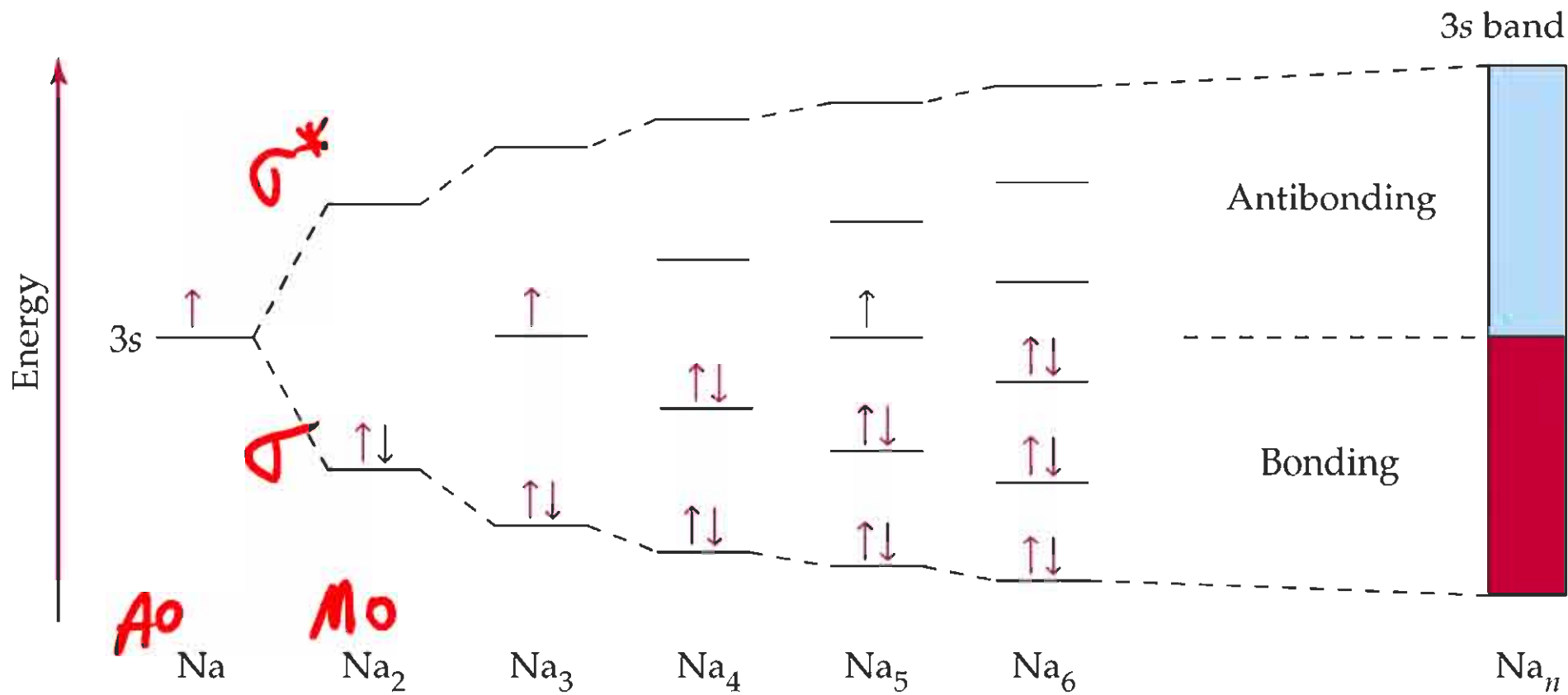
Lecture 13

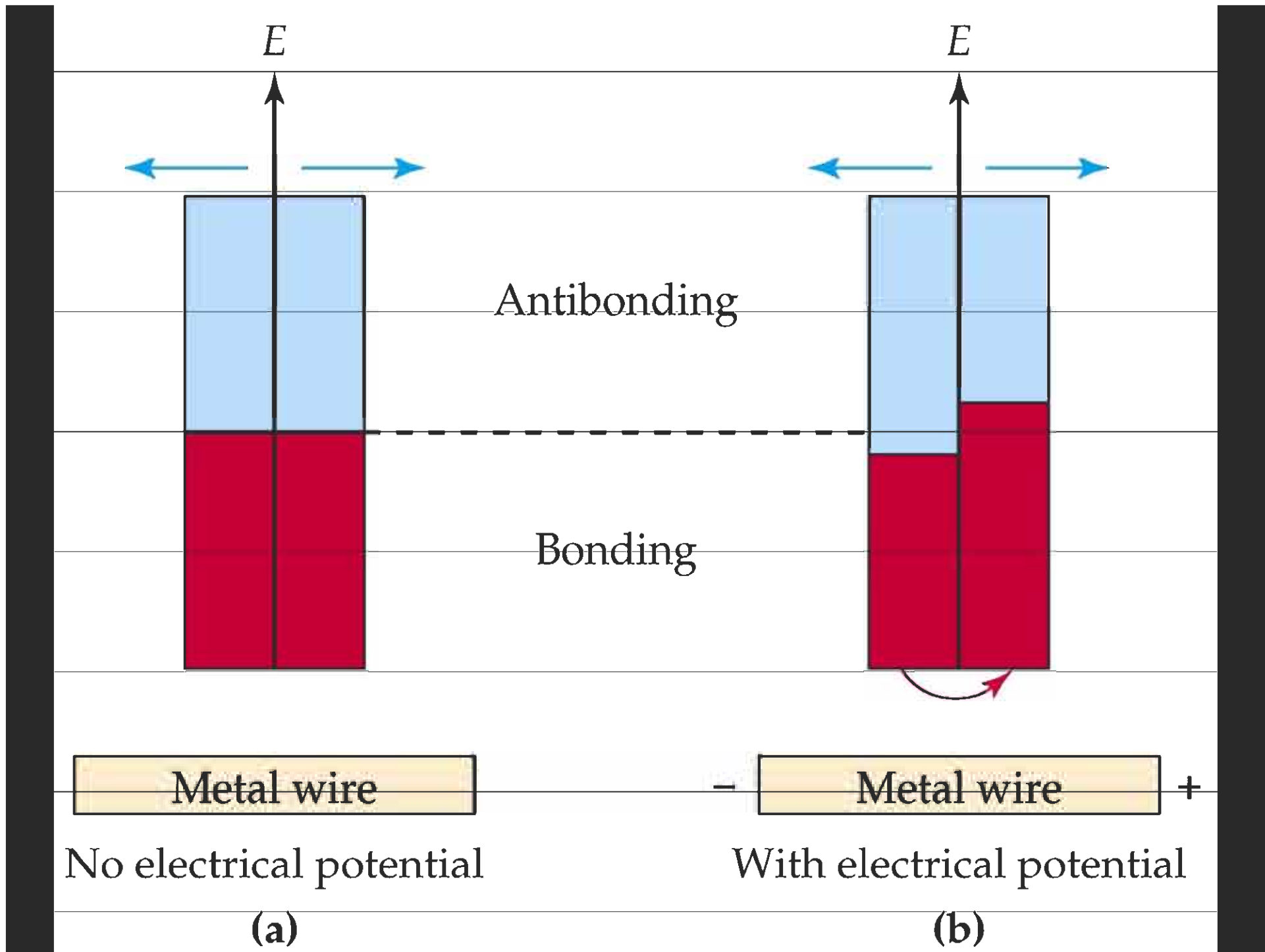
October 8, 2004

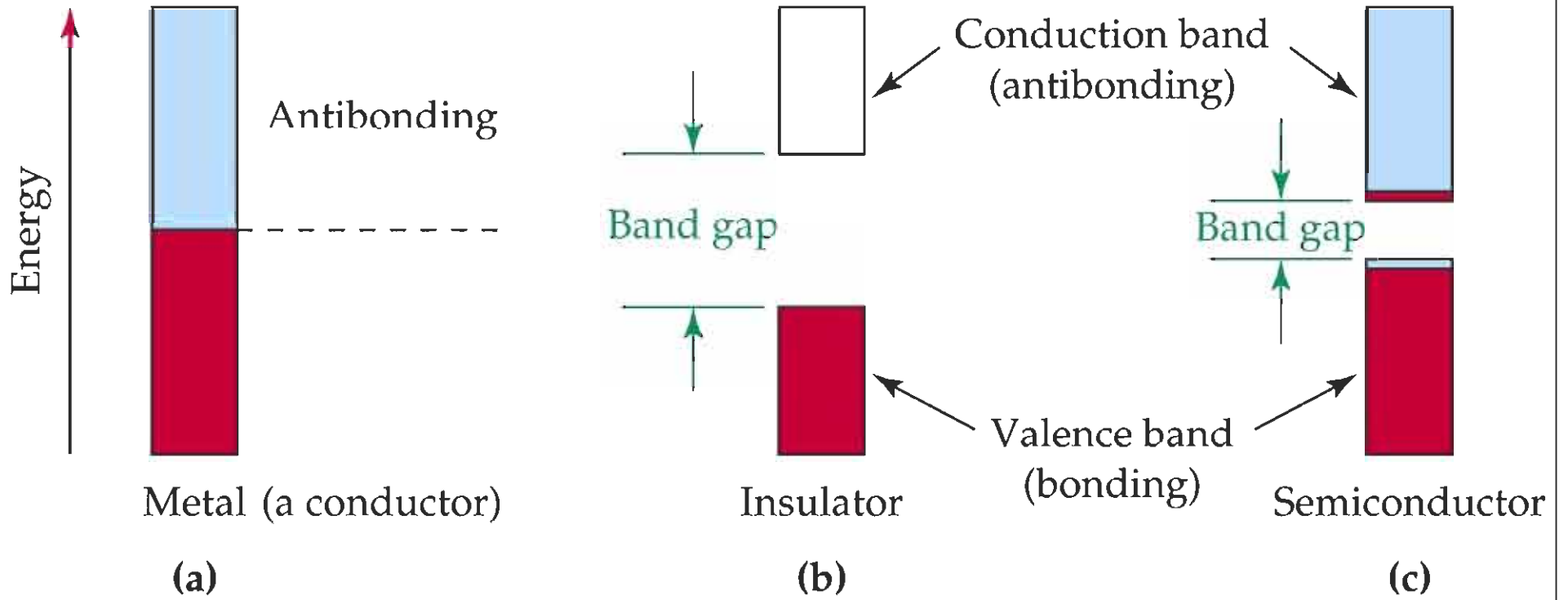
Sea of delocalized, mobile  
valence electrons



Cations in an  
ordered array







$E_g = E_g(z)$   
in group 14

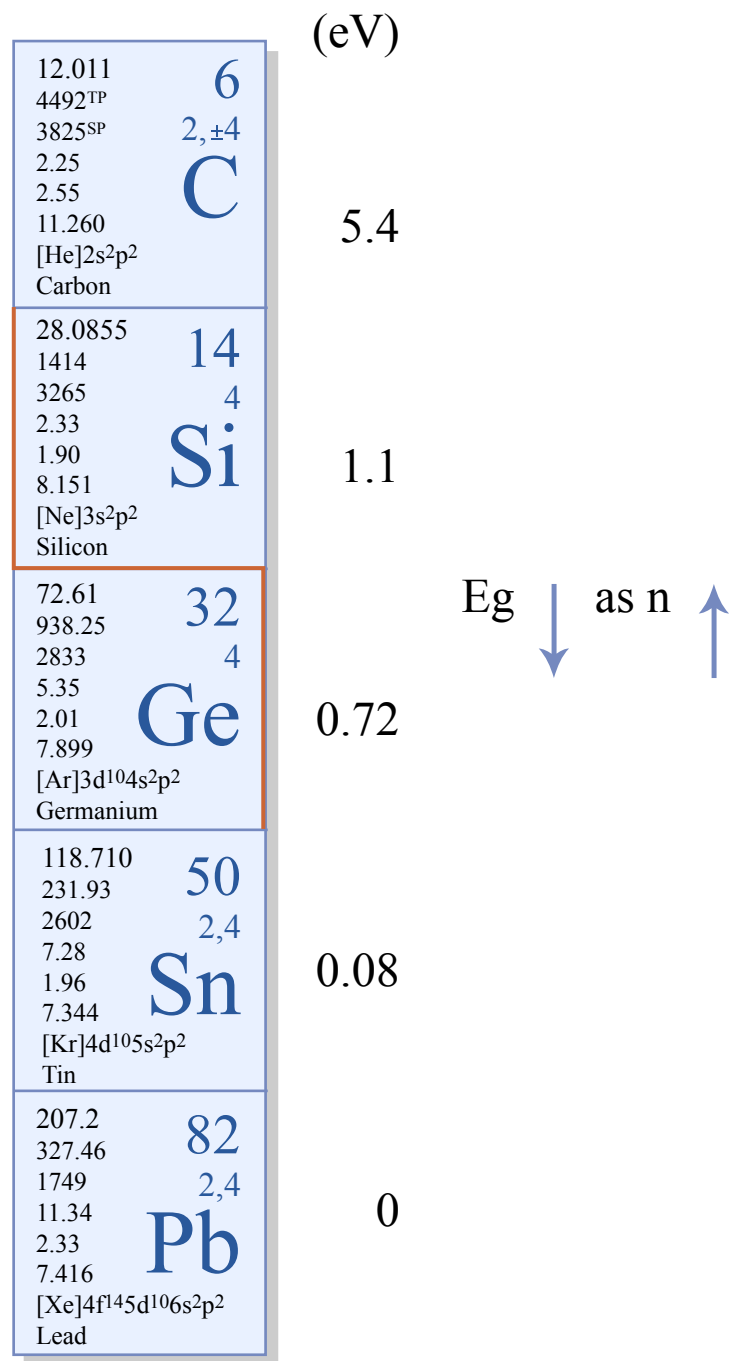


Figure by MIT OCW.

## Values of Electrical Conductivity ( $S m^{-1}$ )

silver	$6.1 \times 10^7$
copper	$5.9 \times 10^7$
aluminum	$3.7 \times 10^7$
stainless steel	$1.4 \times 10^6$
graphite	$7.3 \times 10^4$
lead dioxide	$1.1 \times 10^4$
silicon	$4.4 \times 10^{-4}$
germanium	$1.1 \times 10^{-5}$
gallium arsenide	$10^{-6}$
diamond	$10^{-11}$
PMMA	$<10^{-12}$
aluminum oxide	$10^{-14}$
polystyrene	$<10^{-14}$
PTFE	$<10^{-16}$

