

Ch 7.3 ionization energy (IE)

- minimum energy to remove an e^- from an atom/ion in the gas phase



etc

recall: Coulomb's law

$$F_{att} = k \frac{q_1 \cdot q_2}{r^2}$$

$$Z_{eff} = Z - S$$

background

work energy theorem

"use energy to do work"

periodic trend in IE

in a row, left \rightarrow right:

$\left. \begin{array}{l} \uparrow Z \\ \uparrow S \end{array} \right\} \rightarrow \uparrow Z_{eff} \rightarrow \uparrow F_{att} \rightarrow \text{harder to remove } e^-$

$\uparrow IE \leftarrow \text{use/need more energy to remove } e^- \leftarrow \text{do more work to remove } e^-$

right → left; ... ↓ I E

in a column: top → bottom

recall: relate e- config to periodic table

↓
∃ an additional shell of e-

↓
↑ r
↓

↓ Fstt → easier to → need less
remove e- energy
to remove

bottom → top: ... ↑ I E

↓ I E