Trend

① atoms   (H) $\xrightarrow{\text{smaller}}$ (He)   increased nuclear charge

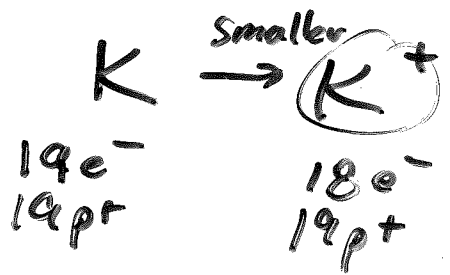② pos. ions   (K$^+$) $\xrightarrow{\text{smaller}}$ (Ca^{2+})   more pull from p$^+$
    18e$^-$ 18e$^-$ same # of e$^-$
    19p$^+$ 20p$^+$
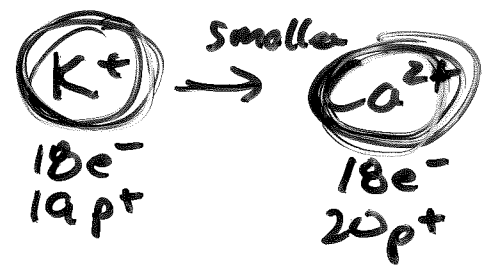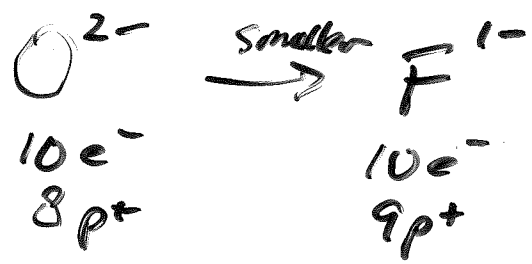
③ neg ions   O^{2-} $\xrightarrow{\text{smaller}}$ F^{1-} more pull from p$^+$
    10e$^-$ 10e$^-$ same # of e$^-$
    8p$^+$ 9p$^+$

④ atom compared to ⊕ ion   K $\xrightarrow{\text{smaller}}$ (K$^+$)   less e$^-$, same p$^+$
    19e$^-$ 18e$^-$ pulls tighter
    19p$^+$ 19p$^+$

⑤ atom compared to ⊖ ion   Cl $\xrightarrow{\text{Larger}}$ Cl$^-$
    17e   18e
    17p$^+$ 17p$^+$
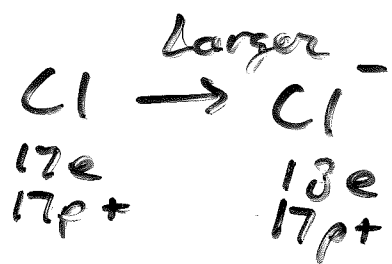
⑥ Going down a group   He
    - atoms   Ne
    or - ions   Ar $\downarrow$ Larger!
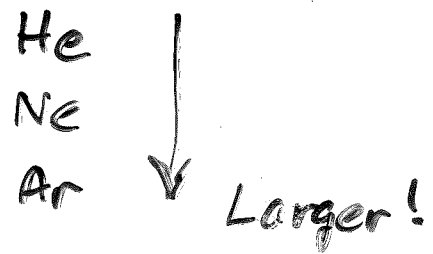
Why?

① Higher Energy levels
② electron repulsion
③ "shielding"