

Enriched Chem Ch6 WKst: Trends - AP Level questions

D

A) The 6 isotopes of selenium have the same number of protons (34). But a different number of neutrons causing different masses 1pt

B) Se complete electron configuration
 $1s^2 \underline{2s^2 2p^6} 3s^2 3p^6 4s^2 3d^{10} 4p^4$ 1pt

(No credit for $[Ar]4s^2 3d^{10} 4p^4$)

1 6 7 7

unpaired electrons

There are 2 unpaired electrons 1pt

Reason: Hund's Rule, each orbital (p has 3) gets 1 electron before another gets a second 1pt

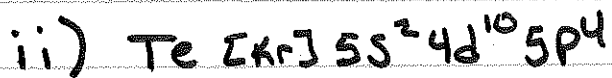
C)

i) Br $[Ar] 4s^2 3d^{10} 4p^5$
1 6 1 7

Se $[Ar] 4s^2 3d^{10} 4p^4$
1 6 1 7

1pt The ionized electron in both Se & Br are in the same energy level ($n=4$), but Br has one more proton than Se \therefore radius is smaller for Br & it has a greater nuclear charge than Se. Z_{eff} higher for Br than Se

c)



The electron for Te is removed from $5p^4$ vs $4p^4$ for Se. Te $5p^4$ has more shielding, due to another energy level \therefore Te's electron will require less energy to remove than Se

1pt

2)

	Radius		
A) Ca	.197 nm	why?	$1s^2 2s^2 2p^6 3s^2 3p^6 4s^2$
Ca ⁺²	.099 nm		$1s^2 2s^2 2p^6 3s^2 3p^6 4s^0$

1pt

Ca⁺² has 2 fewer electrons. The Ca⁺² ion has lost its 4s subshell making the ion smaller.

1pt explanation

B) Ca Zn ? why
0 vs 0



Zn Atom has more protons (10) than an Ca Atom,

causing more Z_{eff} for Zn

1pt