

“Nick The Camel” and beyond... Bauck’s polyatomic ion summary

number of consonants = number of oxygen atoms in the ion

number of vowels = negative charge of the ion

Nick	the	Camel	<u>ATE</u>	a	Clam	for	Supper	in	Phoenix...
<u>nitrate</u>		<u>carbonate</u>			<u>chlorate</u>		<u>sulfate</u>		<u>phosphate</u>
$(\text{NO}_3)^{-1}$		$(\text{CO}_3)^{-2}$			$(\text{ClO}_3)^{-1}$		$(\text{SO}_4)^{-2}$		$(\text{PO}_4)^{-3}$

“-ATE ions ATE more.” -ITE ions have one less oxygen than the –ATE form.

<u>nitrite</u>	<u>carbonite</u>	<u>chlorite</u>	<u>sulfite</u>	<u>phosphite</u>
$(\text{NO}_2)^{-1}$	$(\text{CO}_2)^{-2}$	$(\text{ClO}_2)^{-1}$	$(\text{SO}_3)^{-2}$	$(\text{PO}_3)^{-3}$

“hypo” = 1 less O

“per” = 1 more O

<u>hypochlorite</u>	<u>perchlorate</u>	permanganate
$(\text{ClO})^{-1}$	$(\text{ClO}_4)^{-1}$	$(\text{MnO}_4)^{-1}$

H has a +1 charge, so the charge of the original ion is reduced by 1.

<u>hydrogen carbonate</u> (bicarbonate)	<u>hydrogen sulfate</u> (bisulfate)
$(\text{HCO}_3)^{-1}$	$(\text{HSO}_4)^{-1}$

Br is next to Cl (see chlorate)

As is next to P (see phosphate)

bromate	arsenate
$(\text{BrO}_3)^{-1}$	$(\text{AsO}_4)^{-3}$

MORE →

... and Nick ate Crabgrass for dessert.

dichromate = two Cr. Use the same consonant and vowel rules for Nick The Camel.

dichromate $(\text{Cr}_2\text{O}_7)^{-2}$

chromate $(\text{CrO}_4)^{-2}$ (similar setup to **sulfate**)

OTHER IONS...

Ammonium is the only positive polyatomic ion on the list given at the beginning of the school year. It has a similar formula to ammonia, which is NH_3 .

ammonium $(\text{NH}_4)^{+1}$

“Hydroxide is the one”

hydroxide $(\text{OH})^{-1}$

“CyaNide is the dangerous one”

cyanide $(\text{CN})^{-1}$

oxalate... ox makes me think of a cow. “COw goes moo, 2-4-2.”

oxalate $(\text{C}_2\text{O}_4)^{-2}$

Acetate has two arrangements, both with the same charge:

“CHO 2-3-2”

acetate $(\text{C}_2\text{H}_3\text{O}_2)^{-1}$

“C-H-3 Cooooooo”

acetate $(\text{CH}_3\text{COO})^{-1}$

Silicate has two formulas: $(\text{SiO}_3)^{-2}$, which is used more in the Chem 1H book, and $(\text{SiO}_4)^{-1}$, which is used more in AP Chemistry.

Two ions on our list begin with THIO- (indicating S is present) and end in -ATE:

There are similarities to cyanide and sulfate.

thiocyanate $(\text{SCN})^{-1}$

thiosulfate $(\text{S}_2\text{O}_3)^{-2}$