

Chemical Formula Writing Worksheet

Determine the chemical formula for each cation and anion combination. Write your answers in each box.

Set 1 (The combining power of silver is 1 and zinc is 2)

Cations \ Anions	chloride	oxide	iodide	hydride	sulfide	nitride
Sodium						
Potassium						
Magnesium						
Calcium						
Copper(II)						
Iron(II)						
Iron(III)						
Silver						
Zinc						
Aluminum						

Set 2

Cations \ Anions	bromide	oxide	fluoride	astatide	selenide	phosphide
Lithium						
Barium						
Cesium						
Strontium						
Copper(I)						
Copper(II)						
Lead(II)						
Lead(IV)						
Gallium						
Nickel(II)						

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Determine the chemical formula for each cation and anion combination. Write your answers in each box.

Brackets are only needed when the polyatomic group is greater than 1. Eg. Strontium phosphate, $\text{Sr}_3(\text{PO}_4)_2$

Set 3 (The combining power of silver is 1 and zinc is 2. The formula for the ammonium ion is NH_4^+)

Cations \ Anions	-	nitrate NO_3^-	sulfate SO_4^{2-}	hydroxide OH^-	carbonate CO_3^{2-}	phosphate PO_4^{3-}	hydrogen carbonate HCO_3^-
	+						
Sodium							
Potassium							
Magnesium							
Barium							
Iron(II)							
Iron(III)							
Silver							
Zinc							
Aluminum							
Ammonium							

Set 4 (The combining power of silver is 1 and zinc is 2. The formula for the ammonium ion is NH_4^+)

Cations \ Anions	-	nitrite NO_2^-	chromate CrO_4^{2-}	sulfite, SO_3^{2-}	dichromate $\text{Cr}_2\text{O}_7^{2-}$	chlorate ClO_3^-	acetate* CH_3COO^-
	+						
Lithium							
Mercury(I)							
Tin(II)							
Silver							
Iron(II)							
Iron(III)							
Barium							
Zinc							
Aluminum							
Ammonium							

*The acetate group, CH_3COO^- is written first as this correctly shows the position of the ionic bond. Eg. $\text{CH}_3\text{COO}^- \text{Na}^+$

Chemical Formula Writing Worksheet - Answers

Set 1 (The combining power of silver is 1 and zinc is 2)

		Anions -					
		chloride Cl ⁻	oxide O ²⁻	iodide I ⁻	hydride H ⁻	sulfide S ²⁻	nitride N ³⁻
Cations +							
Sodium	Na ⁺	NaCl	Na ₂ O	NaI	NaH	Na ₂ S	Na ₃ N
Potassium	K ⁺	KCl	K ₂ O	KI	KH	K ₂ S	K ₃ N
Magnesium	Mg ²⁺	MgCl ₂	MgO	MgI ₂	MgH ₂	MgS	Mg ₃ N ₂
Calcium	Ca ²⁺	CaCl ₂	CaO	CaI ₂	CaH ₂	CaS	Ca ₃ N ₂
Copper(II)	Cu ²⁺	CuCl ₂	CuO	CuI ₂	CuH ₂	CuS	Cu ₃ N ₂
Iron(II)	Fe ²⁺	FeCl ₂	FeO	FeI ₂	FeH ₂	FeS	Fe ₃ N ₂
Iron(III)	Fe ³⁺	FeCl ₃	Fe ₂ O ₃	FeI ₃	FeH ₃	Fe ₂ S ₃	FeN
Silver	Ag ⁺	AgCl	Ag ₂ O	AgI	AgH	Ag ₂ S	Ag ₃ N
Zinc	Zn ²⁺	ZnCl ₂	ZnO	ZnI ₂	ZnH ₂	ZnS	Zn ₃ N ₂
Aluminum	Al ³⁺	AlCl ₃	Al ₂ O ₃	AlI ₃	AlH ₃	Al ₂ S ₃	AlN

Set 2

		Anions -					
		bromide Br ⁻	oxide O ²⁻	fluoride F ⁻	astatide At ⁻	selenide Se ²⁻	phosphide P ³⁻
Cations +							
Lithium	Li ⁺	LiBr	Li ₂ O	LiF	LiAt	Li ₂ Se	Li ₃ P
Barium	Ba ²⁺	BaBr ₂	BaO	BaF ₂	BaAt ₂	BaSe	Ba ₃ P ₂
Cesium	Cs ⁺	CsBr	Cs ₂ O	CsF	CsAt	Cs ₂ Se	Cs ₃ P
Strontium	Sr ²⁺	SrBr ₂	SrO	SrF ₂	SrAt ₂	SrSe	Sr ₃ P ₂
Copper(I)	Cu ⁺	CuBr	Cu ₂ O	CuF	CuAt	Cu ₂ Se	Cu ₃ P
Copper(II)	Cu ²⁺	CuBr ₂	CuO	CuF ₂	CuAt ₂	CuSe	Cu ₃ P ₂
Lead(II)	Pb ²⁺	PbBr ₂	Pb ₂ O ₃	PbF ₃	PbAt ₂	PbSe	Pb ₃ P ₂
Lead(IV)	Pb ⁴⁺	PbBr ₄	Pb ₂ O	PbF ₄	PbAt ₄	PbSe ₂	Pb ₃ P ₄
Gallium	Ga ³⁺	GaBr ₃	Ga ₂ O ₃	GaF ₃	GaAt ₃	Ga ₂ Se ₃	GaP
Nickel(II)	Ni ²⁺	NiBr ₂	NiO	NiF ₂	NiAt ₂	NiSe	Ni ₃ P ₂

Chemical Formula Writing Worksheet - Answers

Brackets are only needed when the polyatomic group is greater than 1. Eg. Strontium phosphate, $\text{Sr}_3(\text{PO}_4)_2$

Set 3 (The combining power of silver is 1 and zinc is 2. The formula for the ammonium ion is NH_4^+)

		Anions -		Cations +			
		nitrate NO_3^-	sulfate SO_4^{2-}	hydroxide OH^-	carbonate CO_3^{2-}	phosphate PO_4^{3-}	hydrogen carbonate HCO_3^-
Sodium	Na^+	LiNO_3	Li_2SO_4	LiOH	Li_2CO_3	Li_3PO_4	LiHCO_3
Potassium	K^+	KNO_3	K_2SO_4	KOH	K_2CO_3	K_3PO_4	KHCO_3
Magnesium	Mg^{2+}	$\text{Mg}(\text{NO}_3)_2$	MgSO_4	$\text{Mg}(\text{OH})_2$	MgCO_3	$\text{Mg}_3(\text{PO}_4)_2$	$\text{Mg}(\text{HCO}_3)_2$
Barium	Ba^{2+}	$\text{Ba}(\text{NO}_3)_2$	BaSO_4	$\text{Ba}(\text{OH})_2$	BaCO_3	$\text{Ba}_3(\text{PO}_4)_2$	$\text{Ba}(\text{HCO}_3)_2$
Iron(II)	Fe^{2+}	$\text{Fe}(\text{NO}_3)_2$	FeSO_4	$\text{Fe}(\text{OH})_2$	FeCO_3	$\text{Fe}_3(\text{PO}_4)_2$	$\text{Fe}(\text{HCO}_3)_2$
Iron(III)	Fe^{3+}	$\text{Fe}(\text{NO}_3)_3$	$\text{Fe}_2(\text{SO}_4)_3$	$\text{Fe}(\text{OH})_3$	$\text{Fe}_2(\text{CO}_3)_3$	FePO_4	$\text{Fe}(\text{HCO}_3)_3$
Silver	Ag^+	AgNO_3	Ag_2SO_4	AgOH	Ag_2CO_3	Ag_3PO_4	AgHCO_3
Zinc	Zn^{2+}	$\text{Zn}(\text{NO}_3)_2$	ZnSO_4	$\text{Zn}(\text{OH})_2$	ZnCO_3	$\text{Zn}_3(\text{PO}_4)_2$	$\text{Zn}(\text{HCO}_3)_2$
Aluminum	Al^{3+}	$\text{Al}(\text{NO}_3)_3$	$\text{Al}_2(\text{SO}_4)_3$	$\text{Al}(\text{OH})_3$	$\text{Al}_2(\text{CO}_3)_3$	AlPO_4	$\text{Al}(\text{HCO}_3)_3$
Ammonium	NH_4^+	NH_4NO_3	$(\text{NH}_4)_2\text{SO}_4$	NH_4OH	$(\text{NH}_4)_2\text{CO}_3$	$(\text{NH}_4)_3\text{PO}_4$	NH_4HCO_3

Set 4 (The combining power of silver is 1 and zinc is 2. The formula for the ammonium ion is NH_4^+)

		Anions -		Cations +			
		nitrite NO_2^-	chromate CrO_4^{2-}	sulfite, SO_3^{2-}	dichromate $\text{Cr}_2\text{O}_7^{2-}$	chlorate ClO_3^-	acetate* CH_3COO^-
Lithium	Li^+	LiNO_2	Li_2CrO_4	Li_2SO_3	$\text{Li}_2\text{Cr}_2\text{O}_7$	LiClO_3	CH_3COOLi
Mercury(I)	Hg^+	HgNO_2	Hg_2CrO_4	Hg_2SO_3	$\text{Hg}_2\text{Cr}_2\text{O}_7$	HgClO_3	CH_3COOHg
Tin(II)	Sn^{2+}	$\text{Sn}(\text{NO}_2)_2$	SnCrO_4	$\text{Sn}(\text{SO}_3)_2$	SnCr_2O_7	$\text{Sn}(\text{ClO}_3)_2$	$(\text{CH}_3\text{COO})_2\text{Sn}$
Silver	Ag^+	AgNO_2	Ag_2CrO_4	AgSO_3	$\text{Ag}_2\text{Cr}_2\text{O}_7$	AgClO_3	CH_3COOAg
Iron(II)	Fe^{2+}	$\text{Fe}(\text{NO}_2)_2$	FeCrO_4	$\text{Fe}(\text{SO}_3)_2$	FeCr_2O_7	$\text{Fe}(\text{ClO}_3)_2$	$(\text{CH}_3\text{COO})_2\text{Fe}$
Iron(III)	Fe^{3+}	$\text{Fe}(\text{NO}_2)_3$	$\text{Fe}_2(\text{CrO}_4)_3$	$\text{Fe}_2(\text{SO}_3)_3$	$\text{Fe}_2(\text{Cr}_2\text{O}_7)_3$	$\text{Fe}(\text{ClO}_3)_3$	$(\text{CH}_3\text{COO})_3\text{Fe}$
Barium	Ba^{2+}	$\text{Ba}(\text{NO}_2)_2$	BaCrO_4	$\text{Ba}(\text{SO}_3)_2$	BaCr_2O_7	$\text{Ba}(\text{ClO}_3)_2$	$(\text{CH}_3\text{COO})_2\text{Ba}$
Zinc	Zn^{2+}	$\text{Zn}(\text{NO}_2)_2$	ZnCrO_4	$\text{Zn}(\text{SO}_3)_2$	ZnCr_2O_7	$\text{Zn}(\text{ClO}_3)_2$	$(\text{CH}_3\text{COO})_2\text{Zn}$
Aluminum	Al^{3+}	$\text{Al}(\text{NO}_2)_3$	$\text{Al}_2(\text{CrO}_4)_3$	$\text{Al}_2(\text{SO}_3)_3$	$\text{Al}_2(\text{Cr}_2\text{O}_7)_3$	$\text{Al}(\text{ClO}_3)_3$	$(\text{CH}_3\text{COO})_3\text{Al}$
Ammonium	NH_4^+	NH_4NO_2	$(\text{NH}_4)_2\text{CrO}_4$	NH_4SO_3	$(\text{NH}_4)_2\text{Cr}_2\text{O}_7$	NH_4ClO_3	$\text{CH}_3\text{COONH}_4$

*The acetate group, CH_3COO^- is written first as this correctly shows the position of the ionic bond. Eg. $\text{CH}_3\text{COO}^-\text{Na}^+$