Acid Base Properties of Salts

Type o	f Salt	Examples	Comment	pH of Solution	
Cation is from a strong base, anion from a weak acid		NaC2H3O2 KCN, NaF	Cation is neutral, Anion is basic	Basic	
	The basic a	anion can accept a proton	from water:		
C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> - +	H <sub>2</sub> O	≒	HC <sub>2</sub> H <sub>3</sub> O <sub>2</sub> +	OH-	
Base	acid		acid	base	
Cation is the conjugate acid of a weak base, anion		NH <sub>4</sub> CI,	Cation is acidic,	Acidic	
is from a strong acid		NH4NO3	Anion is neutral	7 (01010	
		ic cation can act as a prot			
NH <sub>4+</sub>		≒	NH₃(aq) +	H <sub>+</sub> (aq)	
Acid			Conjugate base	Proton	
Cation is the conjugate acid of a weak base, anion		NH4C2H3O2	Cation is acidic,	See below	
is conjugate base of a weak acid		NH <sub>4</sub> CN	Anion is basic		
⇒ IF K <sub>a</sub> for the acid	ic ion is greater than $K_b$ for	the basic <b>ion</b> , the solution	is acidic		
		the acidic <b>ion</b> , the solution			
⇒ IF K <sub>b</sub> for the basic	c ion is equal to Ka for the	acidic ion, the solution is ne	eutral 	1	
Cation is a highly charged metal ion; Anion is from strong acid		AI(NO3)3 FeCl3	Hydrated cation acts as an	Acidic	
			acid; Anion is neutral		
Step #1:					
	6H <sub>2</sub> O	$\rightarrow$	AI(H <sub>2</sub> O) <sub>63+</sub> (aq)	+ Cl <sub>-</sub> (aq)	
Step #1: AICl <sub>3</sub> (s) + Salt	6H <sub>2</sub> O Water	$\rightarrow$	Al(H₂O)63+(aq) Complex Ion	+ Cl-(aq) Anion	
		$\rightarrow$	, , , ,	, ,,	
AlCl <sub>3</sub> (s) + Salt	Water	→ →	, , , ,	, ,,	

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Cation is from a strong base, anion from a weak acid		NaC2H3O2 KCN, NaF	Cation is neutral, Anion is basic	Basic
	The basic a	anion can accept a proton	from water:	
C <sub>2</sub> H <sub>3</sub> O <sub>2</sub> - +	H <sub>2</sub> O	<b>=</b>	HC <sub>2</sub> H <sub>3</sub> O <sub>2</sub> +	$OH_{-}$
Base	acid		acid	base
Cation is the conjugate acid of a weak base, anion		NH <sub>4</sub> CI,	Cation is acidic,	Acidic
is from a strong acid	g acid NH4NO3 Anion is neutral		Acidic	
	The acid	ic cation can act as a proto	on donor:	
NH <sub>4+</sub>	(aq)	≒	NH <sub>3</sub> (aq) +	H <sub>+</sub> (aq)
Acid			Conjugate base	Proton
Cation is the conjugate acid of a weak base, anion		NH4C2H3O2	Cation is acidic,	See below
is conjugate base of a weak acid		NH4CN	Anion is basic	
		r the basic <b>ion</b> , the solution i		
		the acidic ion, the solution i		
$\triangleright$ IF $K_b$ for the basi	c ion is equal to K₂ for the	acidic ion, the solution is ne	utral	I
Cation is a highly charged metal ion; Anion is from strong acid		AI(NO <sub>3</sub> ) <sub>3</sub>	Hydrated cation acts as an	
		FeCl <sub>3</sub>	acid; Anion is neutral	Acidic
Step #1:				
AlCl <sub>3</sub> (s) +	6H <sub>2</sub> O	$\rightarrow$	AI(H <sub>2</sub> O) <sub>63+</sub> (aq)	+ Cl-(aq)
Salt	Water		Complex Ion	Anion
Step #2:			1	<u>I</u>
AI(H <sub>2</sub> O) <sub>63+</sub> (aq)		$\rightarrow$	AI(OH)(H <sub>2</sub> O) <sub>52+</sub> (aq)	+ H <sub>+</sub> (aq)
Acid			Conjugate Base	Proton