**Name: Period: Seat#:**

**Worksheet #8**

**Directions:**

* Use the following information and the chart to help you walk through the thought process that is needed in order to determine if a salt is acidic, basic, or neutral

	+ - Strong Acid $→$ Weak Conjugate Base
		 *(not much effect on pH)*
		- Weak Acid$ →$ Strong Conjugate Base
		 *(potential effect on pH)*
		- Strong Base $→$ Weak Conjugate Acid
		 *(not much effect on pH)*
		- Weak Base $→$ Strong Conjugate Acid

 *(potential effect on pH)*

* + - Ion from a Strong Acid $→$ Neutral
		(*is a weak conj. base*)
		- Ion from a Weak Acid $→$ Basic
		(*is a strong conj. base*)
		- Ion from a Strong Base $→$ Neutral
		(*is a weak conj. acid*)
		- Ion from a Weak Base $→$ Acidic
		(*is a strong conj. acid*)
		- Cation is a charged metal ion, and anion is from a strong acid $→$ Acidic metal hydrate + Neutral anion - salt is acidic

* + - Neutral + Acidic = Acidic
		- Neutral + Basic = Basic
		- Neutral + Neutral = Neutral
		- Acidic + Basic = ?
		*Use Ka and Kb to determine* Ka > Kb 🡪 Acidic

Ka < Kb 🡪 Basic
Ka = Kb 🡪 Neutral

* + - Kw = Ka x Kb Kw = 1.0 x 10-14 (*if at 25 °C, may be different if not at 25°C*)

 If you are looking for the Ka of an acidic conjugate ion, use Kw and the Kb of the base it came from

$$K\_{acidic conj. ion}= \frac{K\_{w}}{K\_{b (of the base that the ion came from)}}$$

If you are looking for the Kb of a basic conjugate ion, use Kw and the Ka of the acid it came from

$$K\_{basic conj. ion}= \frac{K\_{w}}{K\_{a (of the acid that the ion came from)}}$$





 

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Salt** | **Cation came from…** | **So Cation makes the solution…** | **Anion came from…** | **So Anion makes the solution…** | **So Salt is…Acidic, Basic, or Neutral?** |
| 1. NaNO2 |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 2. NH4CN |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 3. NH4OCl |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 4. CH3NH3CN |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| **Salt** | **Cation came from…** | **So Cation makes the solution…** | **Anion came from…** | **So Anion makes the solution…** | **So Salt is…Acidic, Basic, or Neutral?** |
| 5. KF |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 6. NH4NO2 |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 7. HONH3ClO4 |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 8. Na2CO3 |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| **Salt** | **Cation came from…** | **So Cation makes the solution…** | **Anion came from…** | **So Anion makes the solution…** | **So Salt is…Acidic, Basic, or Neutral?** |
| 9. NaBr |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 10. C6H5NH3Cl |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 11. LiC2H3O2 |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 12. Na2SO3 |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| **Salt** | **Cation came from…** | **So Cation makes the solution…** | **Anion came from…** | **So Anion makes the solution…** | **So Salt is…Acidic, Basic, or Neutral?** |
| 13. K2C2O4 |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 14. NaOBr |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 15. (CH3NH3)H2PO4 |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 16. NH4I |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| **Salt** | **Cation came from…** | **So Cation makes the solution…** | **Anion came from…** | **So Anion makes the solution…** | **So Salt is…Acidic, Basic, or Neutral?** |
| 17. KNO2 |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |
| 18. C2H5NH3Cl |  |  |  |  | *Think it through…* |
| *Cation is:* | *Anion is:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* | *Which is a:* | *Ka(ion) or Kb(ion) if needed:* |  |