

Hydrolysis

Hydrolysis is essentially the reverse of neutralization. A salt reacts with water to produce an acid and a base. It happens because there are a small number of hydronium and hydroxide ions in pure water. The metal ions from the salt can combine with hydroxide ions to form a base. Of course, if the base formed is strong, it dissociates back into ions, however, if the base formed is weak, it does not dissociate. The nonmetal ions from the salt can combine with hydronium ions in water to form an acid and water. If the acid formed is strong, it ionizes again, but if the acid formed is weak, it does not ionize. The significance of this reaction is, salts may not be neutral. A salt of a strong acid and a weak base is ACID. The salt dissolves in water to form a strong acid which reionizes releasing hydroniums, but it produces a weak base which does not dissociate so hydroxides are removed from solution. A salt of a weak acid and strong base is a BASE. The salt dissolves in water to form a weak acid which does not ionize so it removes hydroniums from solution, but it forms a strong base which dissociates releasing hydroxide.



Not all salts are created equal.

For each of the salt solutions listed below, state whether the solution would be ACID, BASE, or NEUTRAL.

- | | | | |
|---|-------|--|-------|
| 1. $\text{KF}(aq)$ | _____ | 11. $\text{Cs}_2\text{CO}_3(aq)$ | _____ |
| 2. $\text{NH}_4\text{CH}_3\text{COO}(aq)$ | _____ | 12. $\text{MnF}_7(aq)$ | _____ |
| 3. $\text{FeCl}_3(aq)$ | _____ | 13. $\text{Na}_2\text{S}(aq)$ | _____ |
| 4. $\text{Na}_2\text{CO}_3(aq)$ | _____ | 14. $\text{Al}(\text{NO}_3)_3(aq)$ | _____ |
| 5. $\text{AgNO}_3(aq)$ | _____ | 15. $\text{CuSO}_4(aq)$ | _____ |
| 6. $\text{NaBr}(aq)$ | _____ | 16. $\text{BaI}_2(aq)$ | _____ |
| 7. $\text{Li}_3\text{PO}_4(aq)$ | _____ | 17. $\text{Ca}(\text{CH}_3\text{COO})_2(aq)$ | _____ |
| 8. $\text{CaCl}_2(aq)$ | _____ | 18. $\text{NH}_4\text{ClO}_4(aq)$ | _____ |
| 9. $\text{MgSO}_4(aq)$ | _____ | 19. $\text{MgCr}_2\text{O}_7(aq)$ | _____ |
| 10. $\text{NH}_4\text{SO}_4(aq)$ | _____ | 20. $\text{FeSO}_4(aq)$ | _____ |