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There are many chemicals available on the market today that are suitable for use as neutralization chemicals. The most commonly used chemicals are discussed in an article available here, and are in use for good reason.

Magnesium Hydroxide $Mg(OH)_2$

Magnesium Hydroxide [$Mg(OH)_2$]. Also commonly referred to as mag, this chemical is effective in neutralizing acids and has been pushed by some chemical companies. Despite some attempts to advertise it as such, mag is no treatment panacea. As with lime, magnesium hydroxide is more economical to use than caustic (NaOH), however, the difference is not significant unless substantial volumes are in use. As with lime, magnesium hydroxide is also much more difficult to handle than caustic (NaOH).

Magnesium hydroxide is relatively insoluble in water at neutral pH values and higher. Given this, mag has little or no effect on water alkalinity above a pH of 7.0. This means that even in a poorly designed system mag will not raise the pH above a pH of 7.0, rendering this chemical safe to use from a control point of view. Additionally, magnesium hydroxide, also known as milk of magnesia, is quite safe to handle and is not normally toxic.

The characteristic that limits mag's ability to raise the pH above 7.0 (solubility) also contributes to very long reaction times. Typical reaction times for complete neutralization are in the order of 90 minutes. This means that a single reactor tank must have the capacity of 90 minutes of flow. In a 100 gpm system, for example, the first stage reactor must be approximately 9,000 gallons in volume. The alternative is to discharge with an incomplete reaction. This means that the pH will continue to change as the effluent is discharged (never favorable) and an excessive amount of mag must be used. Also as a result if solubility the use of magnesium hydroxide will significantly increase solids loading in the effluent.

Also as a result of solubility, magnesium hydroxide is difficult to handle. Magnesium hydroxide is a slurry that will rapidly separate from solution. The storage tank must be constantly agitated and chemical delivery lines must be kept in motion. Typically recirculation loops are employed with a metering valve, inline, for chemical delivery. Static lines are not acceptable because the slurry will separate, and lines will plug, over time.

There are a few applications where magnesium hydroxide will produce favorable results, however, due to its solubility and long reaction time, magnesium hydroxide is not normally a good choice

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