



Calcium (lime based) sorbents vs. sodium (sorbents)

Cornelia Cretiu

Sodium (Na) and calcium (Ca) are similar in that they are both metals and are at the top of their respective periodic elements table groups and are reactive. Similarities stop there. There are fundamental differences between them that come from chemistry:

1. Solid sodium carbonated salts react with acid gases readily at temperatures higher than 250°F, while calcium carbonate must be introduced at very high temperatures (>1000°F) to have such a reaction happen, and is not that efficient.
2. Sodium carbonated salts, such as sodium sesquicarbonate (trona), and sodium bicarbonate, have wide ranges of temperatures where they can be efficiently used for acid gas mitigation (from 250-1500°F). On the other hand, the peak performance of calcium hydroxide (hydrated lime) has narrow temperature windows and generally depends on the water vapor content.
3. The byproducts of the acid gas mitigation process, the salts formed, are less in quantity of residues per quantity of sorbent in the case of sodium vs. calcium.

Sodium and calcium sorbents have been used as dry sorbents for the past 30 years with great success. Both have applicability in the mitigation of acid gas, but chemistry is unchangeable and as such has bestowed on sodium sorbents, such as sodium bicarbonate and trona, properties that make them particularly well suited for this application.

SOLVAir Solutions
800.765.8292
www.solvair.us



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