



## Characterization and Analysis of Bulk Calcium Ammonium Nitrate Materials

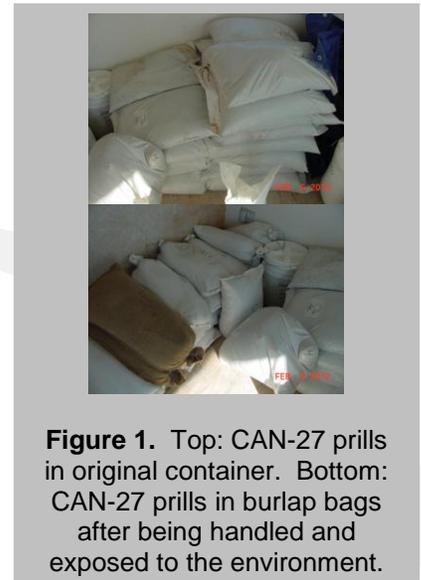
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Calcium and ammonium nitrate are common and important components of inorganic fertilizers. In addition, ammonium nitrate-fuel oil (ANFO) blasting agents represent the largest quantity of industrial explosive material manufactured in the United States. Although nitrate-fuel oil explosives are primarily used in mining and quarrying operations calcium and ammonium based nitrate-fuel oil explosives have been increasingly used in the manufacture of improvised explosive devices (IEDs). The purpose of this study is to provide a detailed characterization of calcium ammonium nitrate (CAN-27) prills in its original containers as well as in environmentally exposed, handled and repackaged prills.

On 06 February 2012, two samples were collected from two distinct groups of prills labeled CAN-27 at the Edgewood M-field site. The bags of CAN-27 included un-weathered prills in the original bags and weathered/repackaged prills in burlap bags (Figure 1). Samples were taken from the two groups of prills using two 500 mL plastic containers.

Characterization of the two sets was performed using a multiple analytical strategy using screening, classical, thermal, and quantitative techniques of analysis. The analysis provided data indicating that environmental exposure from heat, humidity and handling caused changes in the bulk material. Prill size became more easily distributed in weathered material. Prill solubility decreased with weathering. Quantitative analysis showed increases in the amounts of calcium and magnesium while ammonium and nitrate both decreased in weathered samples. This data provides the first information for determining variability in due to weathering in calcium ammonium nitrate materials.



**Figure 1.** Top: CAN-27 prills in original container. Bottom: CAN-27 prills in burlap bags after being handled and exposed to the environment.

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