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## Thermo-Analytical Techniques as useful Quality Control Tools in the Manufacture of Ammonium Per chlorate

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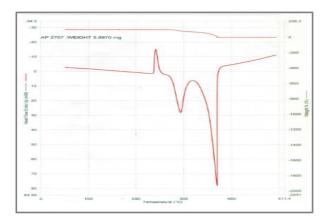
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### ABSTRACT

The utility of thermo-analytical techniques as production quality control tools in the manufacture of ammonium per chlorate is discussed. A random selection of three production batches (Batch capacity of 2 Tons batch<sup>-1</sup>) were selected and studied employing thermo gravimetric (TG) and differential scanning calorimetric (DSC) methods. The endothermic enthalpies of crystallographic phase-transition from orthorhombic to cubic phase of three batches of ammonium per chlorate (AP) are in the range of 133.1 J g<sup>-1</sup>-137.7 J g<sup>-1</sup>, and the corresponding temperatures are in the range of 240.5 °C to 241.8 °C. The peak temperatures of decomposition for the low-temperature decomposition (LTD) are in the range of 293.7 °C to 297 °C; and high-temperature decomposition (HTD) are in the range of 370.3 °C to 376.1 °C. The total exothermic enthalpies are in the range of 1655.6 J g<sup>-1</sup> to 1668.4 J g<sup>-1</sup>. The results are highly reproducible.

### **Graphical Abstract**



TG – DSC Curves of AP Batch No. 2707.

**Keywords:** Ammonium Per chlorate, TG, DSC, Enthalpy, Phase-transition, Decomposition, Quality Control Tool.