



Application Note 231

Analysis of Fertilizers using the CE440 Elemental Analyzer

The analysis of fertilizers for their Carbon and Nitrogen content can be done very rapidly and accurately on the Exeter Analytical CE440. The CE440 elemental analyzer uses thermal conductivity detectors to simultaneously analyze the nitrogen, carbon and hydrogen content. Interferences are removed through column packings and the combusted sample is converted into carbon dioxide, water vapor and nitrogen.

Sample preparation is straightforward. Approximately 3 mg of fertilizer is weighed out in a tin capsule (P/N 6703-0418) which is placed in a nickel sleeve (P/N 6703-0499) for sample containment. A single standard is used to calibrate the instrument. For the data below Acetanilide (71.09%C, 6.71%H and 10.36%N) was used.

Run Parameters

| | |
|-------------------------|--------------|
| Combustion Temperature: | 975°C |
| Reduction Temperature: | 700°C |
| Combustion Time: | 20 Seconds |
| Purge Time: | 15 Seconds |
| Fill Time: | 44 Seconds |
| Sample Weight: | 2.0 - 5.0 mg |

The analysis of liquid fertilizer samples can also be done on the CE440 without sacrificing accuracy or precision. Roughly 3 μ l of sample is drawn into a syringe or micro pipette and injected into a tin capsule. The capsule is then sealed using an Exeter Analytical Capsule Sealer, weighed, and run with the same parameters as solids.

Example data for some common household plant food is shown below.

Analysis Report

| Sample ID | %C | %N |
|----------------------------------|-------|-------|
| Grace-Sierra 10-30-10 Fertilizer | 00.60 | 12.03 |
| (solid) | 00.51 | 12.04 |
| Sterns 8-7-6 Fertilizer | 02.47 | 08.38 |
| (liquid) | 02.48 | 08.36 |