Failure Analysis of Synthetic Dyes Using Pyrolysis-GC/MS Technique

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Abstract:

Using the traditional pyrolysis technique, which is performing flash pyrolysis at a set temperature, the chemical composition difference between the two dyes could not be identified. On the other hand, using the modern Multi-Mode Pyrolyzer, first the thermal profile of both samples was determined from the EGA thermograms. Then the heart-cutting technique revealed the difference between two dyes that was caused by an additive. The Multi-Mode Pyrolyzer provides users with a clear picture of the sample's composition by identifying the thermal zones and the compounds in each zone. Using the obtained EGA thermogram, one can simply program the pyrolyzer's furnace with the appropriate temperature and method. This technique allows multiple analysis on a single sample, while there is no need for any solvent and sample pretreatment as the sample is simply introduced into the GC/MS by the Frontier Multi-Mode Pyrolyzer. Using pyrolysis GC/MS, solid samples can be analyzed. There is no solvent required when using pyrolysis GC/MS as opposed to traditional GC/MS techniques. In other words, the solid and liquid samples can be injected into the pyrolyzer without any solvent and sample pretreatment like solvent extraction.

* Excerpted from online journal website (Click the title)

Frontier Labs Products used:

Multi-Shot Pyrolyzer (EGA/PY-3030D), UADTM-2.5N, Ultra ALLOY^{+}-5