New approach for the kinetic analysis of cellulose using EGA-MS

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Abstract:

This paper describes a new approach for kinetic analysis based on evolved gas analysis-mass spectrometry (EGA-MS) using pyrolyzer-gas chromatography/MS (Py-GC/MS). The kinetic results derived by this model-free kinetic analysis using the EGA-MS thermograms of cellulose were comparable to those using thermogravimetric analysis (TGA). The activation energies were in the range of 149e194 kJ/mol (mean 169 kJ/mol) for EGA/MS and 152e181 kJ/mol (mean 165 kJ/mol) for TGA. This suggests that Py-GC/MS can be used not only for the qualitative analysis of pyrolyzates, but also for the kinetic analysis of pyrolysis.

Frontier Labs Products used:

Multi-Shot Pyrolyzer (EGA/PY-3030D), UA^{+}-5, UA-DTM-2.5N