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Influence of the temperature rise time on pyrograms in analytical pyrolysis

Helena Jönsson and **Lars-Ove Jönsson**
Pyrol AB, Sweden

Thermal degradation by pyrolysis is highly temperature dependent, and the distribution of pyrolysis products is dependent on the actual temperature at thermal decomposition. However it is not widely recognised that the time it takes to reach the equilibrium temperature of the pyrolyzer, the temperature rise time, can have a significant impact on the actual pyrolysis temperature of the sample, and thus on the pyrolysis results. The temperature rise time must be small in relation to the half-decomposition time in order to reach the intended pyrolysis temperature. Furthermore, with a cooling off time of the same order of magnitude it is possible to halt the pyrolysis, and the same sample can then be pyrolyzed again. This is the foundation of the methods of fractionated and sequential pyrolysis, as well as pyrotomy.

Biography

Pyrol AB was established in 1984, based on the findings in Inger Ericsson's doctoral thesis from 1975, "Qualitative, Quantitative and Kinetic Studies of Salts and Polymers with a New Pyrolyzer in Combination with a Gas Chromatograph". Realizing the limitations and imperfections of other pyrolysis instruments, Inger Ericsson developed a new pyrolyzer with extremely fast temperature-rise-time, 8 milliseconds to reach temperatures up to 1400 ºC, for samples sizes in the order of micrograms. This together with a unique non-interfering temperature measurement made it possible to develop the innovative methods, thermal desorption, sequential pyrolysis, fractionated pyrolysis and pyrotomy. Helena Jönsson succeeded Inger Ericsson as CEO of Pyrol AB in 2010.

helena.jonsson@pyrolab.com

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