Thermal Analysis in Asia

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Abstract

The numbers of Thermo-analytical instruments sold to Asia are exceeding the numbers sold in the West.
As this trend must be welcomed by everyone concerned about product quality and process safety it will not surprise as it reflects overall growth and a shift of the global manufacturing base and supply chains.
But does the largely increased installed based of instruments indicate an increasing level of scientific knowledge? The observed number of publications with Asian affiliations clearly seems to indicate so, to insiders however there are multiple challenges to assess the quality and a superficial screening rather indicates incremental improvements and hardly radical progress.
As this preliminary conclusion could be interpreted as a sign of a mature technology and sound methodology [1] there are distinct differences in the Asian countries how Thermal Analysis is developing: The adoption of (ASTM, ISO and JIS) standards in methods and instrumentation leads to know-how transfer in development [2] but to a far lesser extend the tools are used to increase “know-why”. This might be related to teaching, academic career path, differences in the structure of industry research labs, budget availability and allocation, overall level of scientific education and last but not least cultural differences in the use of new technologies.
In parallel a global trend in shifting scientific interest in material science to investigate is changing the topics of practical interest from “pure” (a single chemical species is of interest) to complex matrices (a mix of different species is of interest) with a phenomenological scope of investigation that is served by simpler instrumentation.
Comparing examples from India, China and Japan the influencing factors in academia, application and industry sector interest groups are discussed and the limiting factors speculated about.

Innovation in the field of Thermal Analysis and Calorimetry instrumentation and methodology is today driven by western instrument manufacturers and the eastward diffusion rate is seen as being steady but slow.

References

[1] Sorai (Ed in Chief): Comprehensive Handbook of Calorimetry and Thermal Analysis, 2004
[2] Wagner (Ed.) Thermal Analysis in Practice, 2009