

PAC

Process Analytical Chemistry - Data Acquisition and Data Processing

Main location	Linz (Upper Austria)
Other locations	Kundl (Tirol), Salzburg, Lenzing (Upper Austria), Krems (Lower Austria), Vienna
Thematic field	The goal of the PAC consortium is to gain valid chemical information directly from the process streams in real time. This information should give new chances for optimization of chemical processes in various industries.

Success story summary

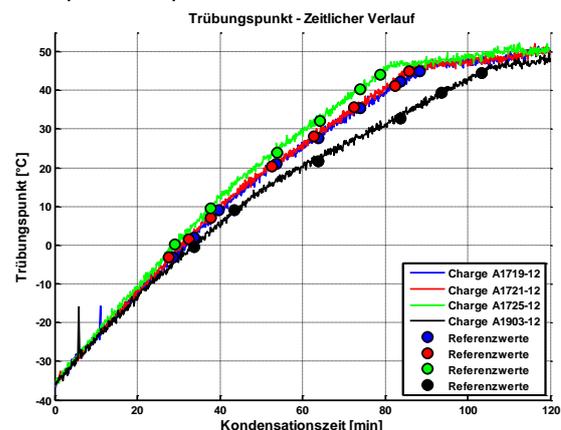
Reduction of manual sampling by nearly 90 percent

In collaboration with company partner DYNEA from Krems, the amount of necessary sampling from chemical production process has been drastically reduced. Previously nine samples had to be taken for each batch. Today, the technicians of the company take one sample per batch, which is only for monitoring and ensuring the ongoing fully automatically gained measurement values. The analysis effort was thus reduced by 89%, allowing the technician to focus on more important activities, and thereby increasing work motivation.

Success story

At company Metadynea in Krems up to nine turbidity point measurements have been made during each batch to determine the optimal stopping point of the condensation. In April 2011 infrared spectroscopic sensors were installed in two different reactors to capture spectroscopic data. Specific models were developed for the different recipes of the product and optimized continuously during the work in the project K-PAC. After a few updates and improvement steps very robust and reliable models could be achieved. During the time of the data collection more and more recipes were analyzed. It was shown, that despite some spectral differences, one common model for the turbidity point is applicable for various recipes. Regarding robustness and long-term stability, such a multi-functional model is even better!

With FTNIR measurements and optimized chemometric model it is possible to determine very reliably and precisely the turbidity point during the condensation. The agreement of these FTNIR measurements with the reference values from the laboratory measurements is shown in the figure on the right. The stopping point of the condensation can be optimally determined with the live provided measurement values of the turbidity point. Since August 2012 the number of manual sampling could thus be reduced from earlier nine to one reference measurement per batch. The measurement is to verify the correctness of the automatically generated values.



Impact and effects

Previously a technician of the company partner had to take and analyze samples and was permanently occupied during the production. The time between two samples was less than 10 minutes - not enough to be otherwise productive. Now the same highly qualified staff has about 90 minutes time that they can use productively for others activities!

Such improvements are helpful for companies with staff shortages and also have a very positive effect on employee motivation! Any manipulation of chemical processes always entails risks and a risk reduction of 90% is very important for the protection of employees!

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