Growing cost-effective and low-defect ingots requires more than experiments!

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Biography (font 12)
After earning his Master degree in Mechanical Engineering from the University of Louvain, Belgium, in 2003, Arnaud de Potter joined the FEMAG*Soft* Customer Relationship Department. After 2 years in close relationship with the product users, he is now principal consultant and project manager for crystal growth processing and optimization, as well as the responsible of the commercial and marketing group.

Abstract:
The current requirements of cost-effective wafers with a long carrier lifetime for the solar market, have made the design of the crystal growth furnace and the whole growth system a very challenging task. Global numerical simulation of bulk crystal growth becomes an indispensable and powerful tool to design, predict and optimize the crystal growth process.

In this talk, the goals and benefits of the numerical simulation of bulk crystal growth processes will be firstly addressed. Based on the objectives of the PV market, this talk will highlight the information that simulations can provide to the crystal growers by means of easy and cheap numerical experiments. These informations give to the crystal grower a better understanding of the process behaviour and increase his capability of process optimization.

The integration of simulation software in a company is very often of key importance and this software will then be used as an R&D tool complementary to crystal growth experiments. Simulation software provides key search directions and optimal operating conditions to experimentalists, while crystal growth experiments provide experimental data for simulation calibration and validation.

An examples of process optimization will be carefully analysed:
Reduction of the energy consumption and increase of the production yield by means of a crystal growth rate increase.

Data: -

Conclusion:
Simulation software is a need for efficient crystal growth process optimization regarding both cost reduction and quality improvement.

References:
L.Y. Huang et al. / Journal of Crystal Growth 261 (2004) 433-443

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