

## **“Big little things” important for a successful crystal growth**

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The Solid State Chemistry Group at PSI is equipped with an optical furnace (Model: FZ-T-10000-HVI-VP-PC, Crystal Systems Corp. Japan) and a recently installed HKZ furnace (SciDre, Dresden), allowing us access to a wide range of temperatures up to 3000 °C and gas pressures up to 150 bars. Using the travelling solvent floating zone (TSFZ) method we have grown lots of crystals belonging to different classes of compounds – complex metal oxides, borates, oxyphosphates, silicates, intermetallic compounds.

Depending on the chemistry of a given material a particular set of crystal growth parameters has to be applied during crystal growth. Nevertheless, even with an individually chosen set of conditions assuming oxidation states of elements, their volatility, congruent/incongruent melting, crystal growth attempts do not always lead to good results.

Using the TSFZ method for many years, I have collected some examples of hidden tuning parameters, which are additional to those usually considered (crystal growth rate, gas atmosphere and pressure). In some cases, they can be crucial for a successful crystal growth. These variables can be a diameter of rods, a special shape of rods, a composition of a seed rod different from a feed rod.