

PVT method and apparatus for the process-safe production of single crystals

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In order to be able to use a reactive gas such as hydrogen as a process gas in a PVT process, special safeguards are required to ensure that the process can be carried out reliably. An apparatus for carrying out the PVT process consists of a highly heatable growth cell arranged in a process chamber whose walls are made of a heat-resistant material, typically quartz glass. The process chamber is filled with hydrogen via an inlet valve. A heating device consists of an induction coil that surrounds the process chamber at the level of the growth cell and heats the growth cell to over 2,000 °C up to 2,400 °C. However, the use of a reactive gas brings with it the problem that, in the event of a rupture of the chamber wall of the process chamber, which cannot be completely ruled out, the reactive gas can mix with the ambient air to form an ignitable gas mixture which would immediately ignite on the hot parts of the apparatus. The process chamber is therefore surrounded by a safety container which is filled with an inert gas.

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(Figure 1)