

## 1.4. THERMAL EXPANSION

LiAlSiO<sub>4</sub>) in a glassy matrix, an expansion coefficient can be achieved that is nearly zero over a desired temperature range.

A compilation of numerical values of the tensor components of more than 400 important crystals of different symmetry is given by Krishnan *et al.* (1979).

Phase transitions are accompanied and characterized by discontinuous changes of derivatives of the free energy. Since the thermal expansion  $\beta$  is a second-order derivative, discontinuities or changes of slope in the  $\beta(T)$  curve are used to detect and to describe phase transitions (*cf.* Chapter 3.1).

## 1.4.5. Glossary

$\alpha_{ij}$	thermal expansion
$\beta$	volume thermal expansion
$\gamma$	Grüneisen parameter
$\kappa$	isothermal compressibility
$u_{ij}$	strain tensor
$c^V$	specific heat at constant volume
$F$	free energy
$p$	pressure
$S$	entropy
$T$	temperature
$V$	volume

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