

Abstract Submitted
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**The Elastic Constants and Related Mechanical Properties of
the Monoclinic Polymorph of the Carbamazepine Molecular Crystal¹**

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property of a compound to crystallize in two or more crystalline phases containing
different arrangements and/or conformations of the molecules in the crystal lattice.
The Phenomenon of polymorphism is a major issue in the pharmaceutical industry
especially in relation to drug uptake in the body, tablet processing and growth. This
has led to considerable interest in predicting and understanding properties of drug
polymorphs, and more recently the mechanical properties of the polymorphs. In this
work, Brillouin scattering is used to probe the acoustic phonons of the monoclinic
($P2_1/c$) polymorph of the drug, carbamazepine (CBZ). By sampling a variety of
acoustic phonons, the complete elastic constant tensor has been determined for this
CBZ polymorph. The observed trend in the elastic constants: $C_{11} < C_{22} \sim C_{33}$ is
qualitatively associated with the crystal growth pattern seen in CBZ. Investigation
into the anisotropy of the intermolecular interactions has been investigated further
by calculation of linear compressibilities.

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