

MS28-1-5 Ribavirin at high pressure

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Abstract

Exhaustive characterisation of polymorphism and phase transitions in active pharmaceutical ingredients (APIs) is of critical importance to pharmaceutical companies in the development of 'solid forms' used in patient therapy. Polymorphs of the same API may differ in their physical properties e.g. solubility, kinetic stability, or tableability; affecting everything from bioavailability to manufacture and storage.[1] We are interested in characterising polymorphism in APIs using high pressure to mediate phase transitions. New polymorphs realised by high pressure may have improved therapeutic properties or identify limitations of the marketed form.

Ribavirin, a broad-spectrum antiviral agent,[2] was studied to 10 GPa using single crystal X-ray diffraction in the diamond anvil cell with synchrotron radiation ($\lambda=0.2916 \text{ \AA}$). Full structure determinations and refinements have been performed for the ambient pressure phase (P212121) which is stable to 5.6 GPa and its pressure-volume equation-of-state determined. The emergence of twinning at 6.3 GPa indicates the formation of a new phase, and efforts are underway to solve the new high-pressure crystal structure.

References

- [1] Jie Lu, Xiaolan Zhan, Lianwei Chen, Lijuan Zhang, and Shimin Mao *J. of Chem. & Eng. Data* 2014 59 (8), 2665-2669
[2] Prusiner, P. & Sundaralingam, M. (1976). *Acta Cryst.* B32, 419-426.

Molecular structure of ribavirin at 5.62 GPa

