Structures of strontium diformate and strontium fumarate. A synchrotron powder diffraction study

The crystal structures of strontium diformate in space groups P2(1)2(1)2(1) (alpha form, 295 K), P4(1)2(1)2(1) (beta form, 334 and 540 K) and I4(1)/amd (delta form, 605 K), and strontium fumarate in space groups Fddd (beta form, 105 K) and I4(1)/amd (alpha form, 293 K) have been determined from synchrotron X-ray powder diffraction data. Except for the alpha-strontium diformate, all the structures are based on a diamond-like Sr-ion arrangement, as in strontium acetylene dicarboxylate. The formate ions are disordered in the delta phase owing to steric hindrance. The fumarate ions are disordered over four (alpha) or two (beta) symmetry-equivalent orientations. alpha-Strontium fumarate crystallizes with a unique 90 degrees carboxylate dihedral angle, and is stable up to 773 K.

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