

## The conformational polymorphism of 1,1,2,2-tetrachloroethane (C<sub>2</sub>H<sub>2</sub>Cl<sub>4</sub>)

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The molecule of 1,1,2,2-tetrachloroethane can appear in two different conformations: *trans* (antiperiplanar) and *gauche* (synclinal). The slight energy difference between both conformers (<1 kcal mol<sup>-1</sup>) [1, 2] means that the polymorphic phases appearing at different temperature and pressure conditions would mainly depend on the intermolecular interactions.

At normal pressure, the stable phase  $\beta$  is known to be orthorhombic (P2<sub>1</sub>2<sub>1</sub>2<sub>1</sub>, Z=8, Z'=2) with only one *gauche* conformation. At high-pressure (ca. 0.65 GPa) the structure of a second polymorph was found to be monoclinic (P2<sub>1</sub>/c, Z=2, Z'=0.5) and formed by only molecules with *trans* conformation [3].

The present work presents a new solid phase in which both *gauche* conformers coexist. This phase is reached by means of recrystallization of the supercooled melt into a new metastable  $\alpha'$  phase, which on heating transforms irreversibly to the stable  $\beta$  phase. The thermodynamic relationships between the different condensed phases as well as the structural details of the new phase will be detailed in the present communication.

### References

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