

MS47-2-1 Expanding horizons - the use of crystallographic structures in high school chemistry classes
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Abstract

The role of molecular models for visualising the “invisible” particle-level in chemistry education cannot be underestimated, especially for younger students in high school chemistry classes. Results from X-ray diffraction experiments can be used to introduce students into a “realistic” understanding of the structure of molecules and intermolecular forces. Especially the Cambridge Structural Database (CSD) houses many structures, which are relevant for chemical issues in undergraduate student courses (Battle *et al.*, 2010) or in school chemistry classes. However, often teachers or teacher students have little knowledge of crystallographic techniques. Therefore, they do not dare to use these results in their chemistry classes.

We make a proposal for educational reconstruction of the basics of X-ray diffraction and the process of crystal structure determination to enable teachers to work with the results. We will show which aspects are needed for this task and where problems and pitfalls may lurk.

We use the CSD teaching subset from the CCDC educational resources via the Mercury structure visualizer for an easy access to structures, which are relevant for chemical issues in school chemistry classes. We will show which program features are most important for exploring the structure of molecules and of intermolecular forces.

We will discuss examples for using CSD structures in different class levels of school chemistry lessons, from classical subjects as bonding types and aromaticity or conformations of hydrocarbons to intermolecular forces or hydrogen bonding.

References

Battle, G. M., Ferrence, G. M. & Allen, F. H. (2010). *J. Appl. Cryst.* **43**, 1208–1223, doi:10.1107/S0021889810024155.