Structure determination from powder diffraction (SDPD) methodology has now reached such a stage that it may be considered as a truly viable alternative to single crystal structure determination for cases where single crystals are not easily obtained. This presentation will review the status of SDPD for the case of molecular organic compounds, with particular reference to the structural complexity that can be routinely tackled from laboratory-based PXRD and how it compares with that of structures deposited in the Cambridge Structural Database. It will also discuss some of the ways in which the methodology is being developed to extend its applicability, and to yield more accurate results in ever shorter timescales.