



Experiment title:  
The Low-Temperature Crystal Structures of  
Globular Organic Molecules

**Experiment  
number:  
CH-90**

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**Report:**

Using a Cryostream cold-nitrogen blower to cool the specimens to 100 K, high-resolution powder diffraction patterns were collected of the ordered, low-temperature phases of various bicyclic organic molecules, at an X-ray wavelength of 0.82637(1) Å. The compounds studied included the pure enantiomeric S-camphor, R-thiocamphor (figure 1), norbornylene, 9-ethylbicyclo[3,3,1]nonan-2,6-dione (figure 2). Powder diffraction patterns were also collected of the orientationally disordered phases of the racemic solid solution RS-camphor, and norbornylene. The samples were contained in fat 1.5 mm diameter thin-walled borosilicate glass capillary tubes and were spun on the axis of the diffractometer. The diffracted X-rays were detected by means of the nine-crystal analyser stage, which provides nine channels of simultaneous detection, separated by 2° in 2θ. The data look to be of excellent quality, and summing and normalisation of the nine channels has been completed.

Some of the diffraction patterns have now been indexed, and attempts to solve the crystal structures by direct methods, or from packing considerations, etc. are proceeding normally.

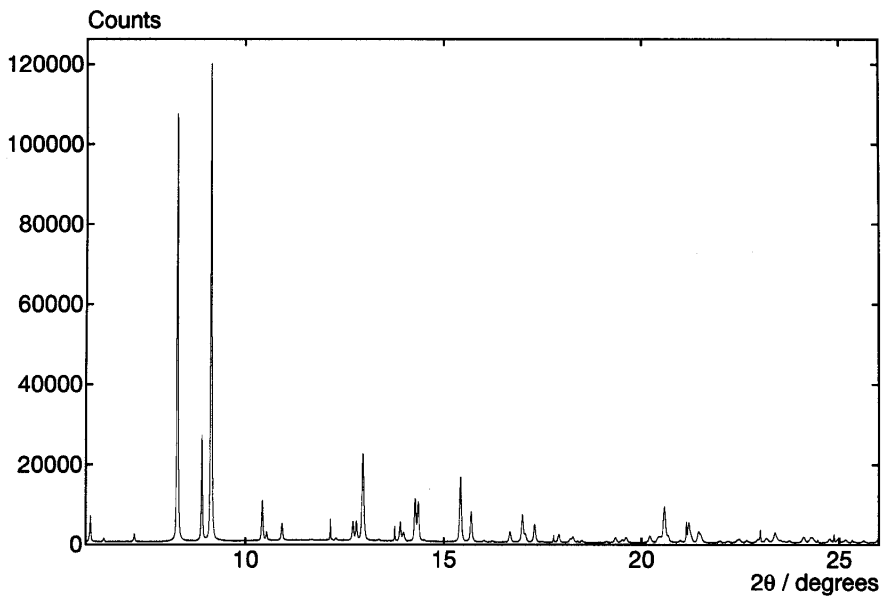


Figure 1. Diffraction pattern of R-thiocamphor at 100 K.

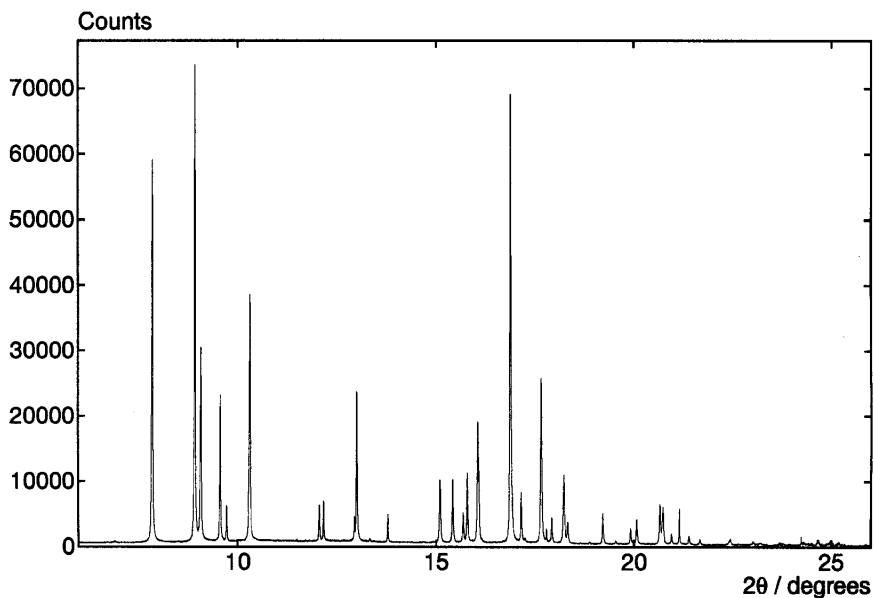


Figure 2. Diffraction pattern of 9-ethylbicyclo[3,3,1]nonan-2,6-dione at 100 K.