

INSTRUMENTATION

[Cl. F. Damay] Upgrade of the 3T2 High Resolution Powder Diffractometer

Research on novel materials of technological interest is an ever expanding area which requires fine structures determination to fully understand and tailor materials properties. Examples in ionic conductors, solid electrolytes, catalysers, high temperature superconductors or magnetic semiconductors can easily be found. Neutron powder diffraction plays a key role in these fields, because it provides an easy way to locate light atoms and to determine an existing magnetic order.

LLB proceeded mid-2005 to an important upgrade of the detection module of the 3T2 high resolution powder diffractometer. Electronics has been replaced by news LLB elements and the spectrometer is now equipped with an array of 50 new ^3He large detectors and 50 new collimators made by the EuroCollimators Ltd company, which provide a resolution of $10'$. Tests show that a gain of 2.5 in the overall detection efficiency has been achieved compared to the previous 3T2.

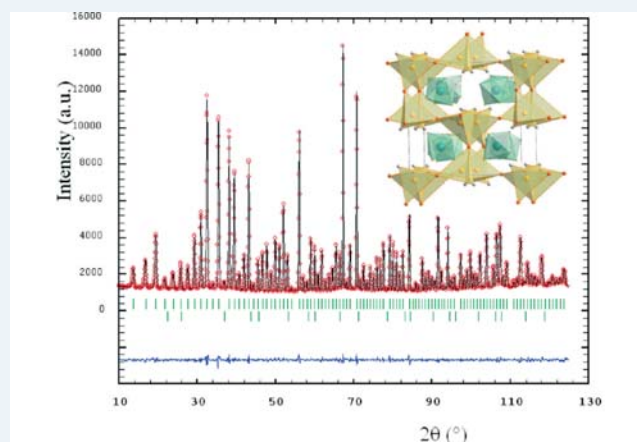
The next objective now is to reduce the background noise in order to get high quality data with smaller quantities of sample. To this purpose, additional neutron shielding has been designed and will be installed at the end of 2006.

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View of the new bank of 50 detectors



Na₂Ca₃Al₂F₁₄ measured with the new 3T2