On the other hand, neutron diffraction experiments have been performed in the La- and Y-doped TbRhIn, intermetallics in the AFM ordered phase (at the dilution limit of 40% of doping) at the Echidna (HRPD) instrument of the OPAL reactor, Australia. Our results show that there are no change in the magnetic moments orientation when compared to the non-doped compound (along tetragonal c-axis), the propagation vector remains the same and the size of the Tb moment is approximately the expected for a single Tb$^{3+}$ ion.

We will discuss the details of magnetic structures determination as a function of CEF effects and how they are responsible in determining the magnetic moment directions for different R ions from this series as well as in determining the $T_c$ evolution along the series and the behavior of magnetic susceptibility and specific heat.


Keywords: diffraction, magnetism, synchrotron

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Structural biology and SAXS beamlines at the photon factory

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The Photon Factory (PF) is currently operating five structural biology beamlines, BL-1A, BL-5A, BL-17A, NW12A, NE3A, and two SAXS beamlines, BL-10C and BL-15A. Whereas all the structural biology beamlines use insertion device sources, the SAXS beamlines are conventional bending magnet sources.

BL-5A, NW12A and NE3A are high-throuput beamlines and we facilitate automation of the beamline operation with developments of sample exchange robots PAM, automated sample centering system and unified beamline control software [1,2]. Recently we started fully-automated data collection operation and it has been well used by the pharmaceutical companies.

BL-1A and BL-17A are small focus beamlines, dedicated to the micro crystal structure determination. In addition, softer x-rays, 4 keV (BL-1A) and 6 keV (BL-17A), are available for low energy SAD structure analysis. We are now developing the helium chamber system to reduce the background.

BL-10C and BL-15A are two of the oldest beamlines at the PF and we have started upgrades of the SAXS beamlines [3]. We installed a 2-dimensional detector, RIGAKU R-AXIS 7 at BL-10C for the experiments of liquid samples. At BL-15A, we installed a flat panel detector, Hamamatsu C9728DK-10 for WAXS exeriments. We have a 2-dimentional detector, RIGAKU R-AXIS 7 at BL-10C for the microcrystal structure determination. In addition, softer xrays, 4 keV are conventional bending magnet sources.

We will move the current BL-15A to BL-6A this summer and plan to construct a new insertion device SAXS beamline at BL-15A. We have a detector, Hamamatsu C9728DK-10 for WAXS exeriments. We have a 2-dimentional detector, RIGAKU R-AXIS 7 at BL-10C for the microcrystal structure determination. In addition, softer xrays, 4 keV are conventional bending magnet sources.

We will discuss the details of magnetic structures determination as a function of CEF effects and how they are responsible in determining the magnetic moment directions for different R ions from this series as well as in determining the $T_c$ evolution along the series and the behavior of magnetic susceptibility and specific heat.


Keywords: diffraction, magnetism, synchrotron

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Magnetic dynamical structures of possible spin-peierls system TiOBr

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Making crystallography appealing to secondary school students

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Science has been established as a critical part of the secondary school curricula. Sadly, Crystallography is often left out of the teaching curricula for students at secondary school. Educators usually assume that teaching crystallography requires advanced science knowledge and that X-ray instruments are insecure, inaccessible, unsafe or difficult to use.

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