SMM 18
Soft Magnetic Materials
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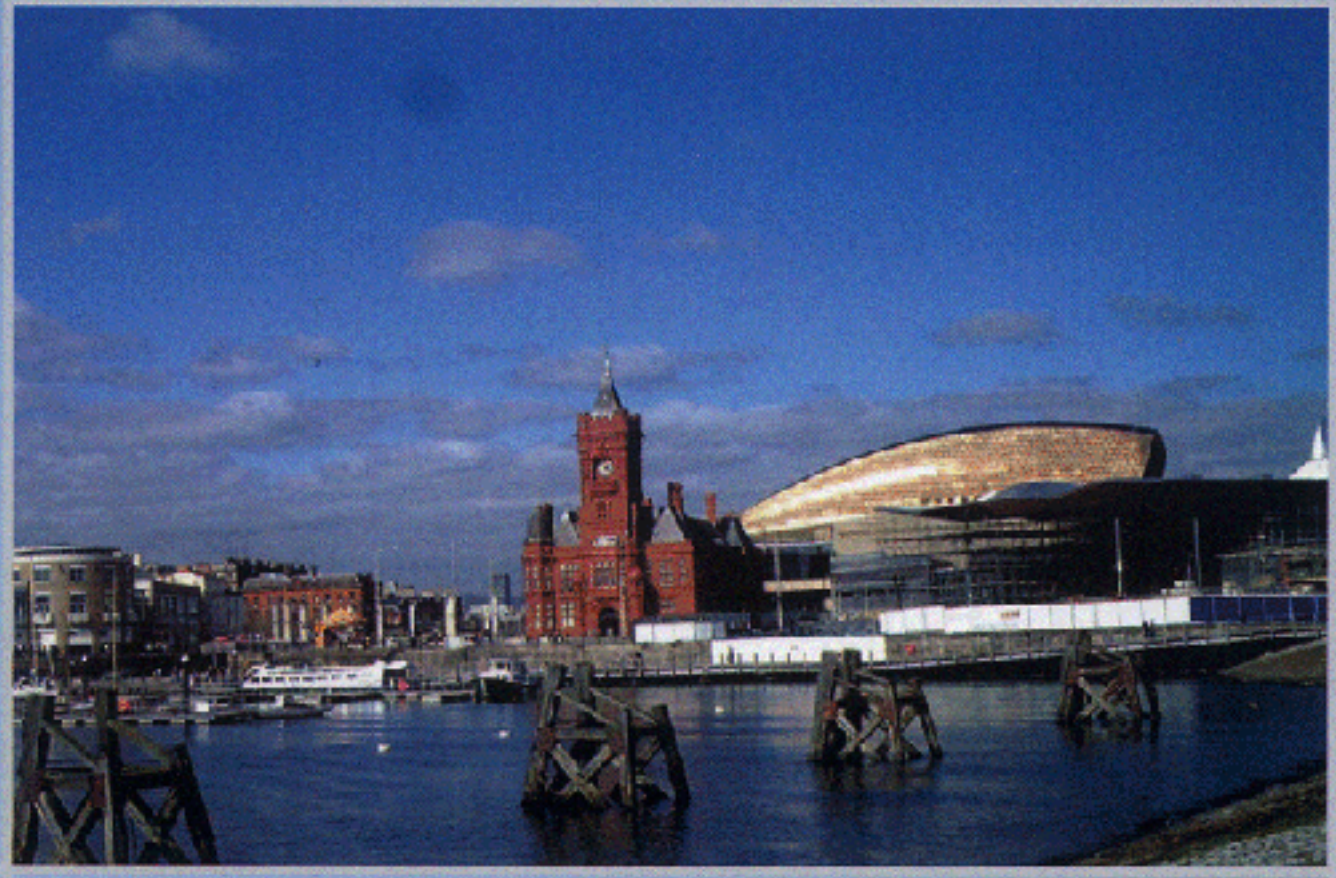
# Soft Magnetic Materials Conference (SMM 18)



# Book of Abstracts

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# MAGNETIC ORDERING IN THE FRUSTRATED SYSTEM $FeSc_2S_4$

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The sample of $FeSc_2S_4$ was prepared by solid reaction method. The crystallographic structure and the magnetic properties of the obtained compound were investigated by X-ray, and SQUID magnetometer and Mössbauer spectroscopy. The polycrystalline $FeSc_2S_4$ confirmed the normal cubic spinel structure (space group *Fd3m*) with Sc occupying only B sites. The lattice constants $a_0$ and anion parameter $u$ are 10.519 Å and 0.255, respectively. The Mössbauer spectroscopy has been studied for the $FeSc_2S_4$ at various temperatures, from 4.2 K to room temperature. The spectra consist of two doublets at 4.2 K while single line at room temperature. It is noticeable that the Mössbauer spectra of two doublet pattern with large electric quadrupole splitting ($\Delta E_Q$) remain over the Néel temperature. Those are interpreted as result of large electric quadrupole interaction compared to magnetic dipole interaction. The magnetic susceptibility measurements were performed with a SQUID magnetometer for temperatures 2<T<320 K, in external fields up to 5 kOe. Magnetic behavior shows antiferromagnetic bahavior, the magnetic superexchange interactions between the Fe ions are weakly antiferromagnetic. The paramagnetic susceptibilities follow a Curie-Weiss (CW) law with CW temperature $\Theta_{CW}$ ~ -100 K, and frustration parameter $f$=-$\Theta_{CW}/T_N$ is of the order of 1000. We conclude that two sublattices are coupled with antiferromagnetically, strongly enforcing the frustration effects.

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