

Ferroelectric and Electronic Property of $R\text{Fe}_2\text{O}_4$

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$R\text{Fe}_2\text{O}_4$ ($R=\text{Y}$, Ho-Lu) [1,2] consists of the stacking of triangular lattice of rare earth and iron ions as shown in figure 1. The equal amount of Fe^{2+} and Fe^{3+} existing in the iron double triangular layer drives a kind of charge frustrated state. It is considered that the charge frustration realizes a ordering of Fe^{2+} and Fe^{3+} in the triangular plane, where the charge arrangement become polar [1,2].

There is long discussion for the presence of the ferroelectricity in this material[3,4]. We report our recent experimental results as, high quality single crystal growth, measurement of the Fermi level, Magneto Electric response detection[5], precise pyroelectric current measurement and succession of the P - E loop measurement[6].

References

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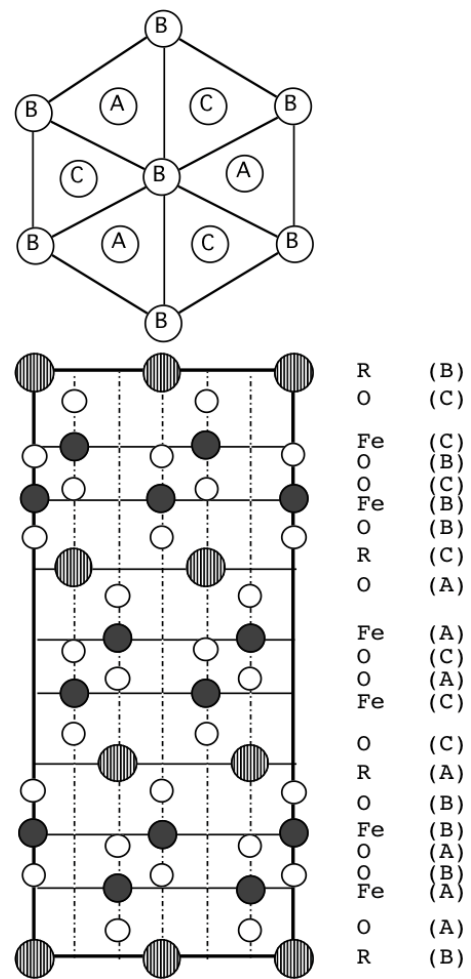


Fig.1 Crystal structure of $R\text{Fe}_2\text{O}_4$