

Abstract Submitted
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Relation between structure and magnetic properties in $(\text{Sr}_{1-x}\text{Ca}_x)_3\text{Ru}_2\text{O}_7$ ¹ J. PENG, Tulane University (TU), Z. QU, TU, L. SPINU, University of New Orleans, T.J. LIU, D. FOBES, Z.Q. MAO, TU — The $(\text{Sr}_{1-x}\text{Ca}_x)_3\text{Ru}_2\text{O}_7$ solid solution series exhibits rich magnetic ground states, ranging from itinerant metamagnetism, ferromagnetic instability, ferromagnetic cluster glass, to antiferromagnet.[1] In this talk, we report a study on the relation between structure and magnetic properties in $(\text{Sr}_{1-x}\text{Ca}_x)_3\text{Ru}_2\text{O}_7$. Our Rietveld refinement of x-ray scattering data shows that the rotation angle of RuO_6 octahedra increases with increasing x , and approaches saturation for $x > 0.2$. The orthorhombicity, which is caused by the tilting of RuO_6 octahedra, occurs for $x > 0.4$ and enhances significantly for $x > 0.7$. By comparing these structural characteristics with the magnetic properties, we conclude that the ferromagnetic instability originates from the RuO_6 octahedra rotation, and the tilting of RuO_6 octahedra causes a significant magnetic anisotropy.

[1] Z. Qu *et al.* arXiv:0708.1291 (2007).

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