



Contribution ID: 61

Type: Poster

Understand the gallium substitution limitations of $\text{YBaCo}_{4-x}\text{Ga}_x\text{O}_7$

The 114-compound material of YBaCo_4O_7 is a mixed cobalt valence system that exists in a hexagonal arrangement (space group $P 6_3mc$), which exhibits interesting physical properties such as magnetism and oxygenation absorption. Cobalt tetrahedra in the 6c position are in a Kagome arrangement which is the source of the magnetic frustration seen in this system. The Co 2a position, located in the triangular layer, involves long-range magnetic ordering at lower temperatures. As both positions (2a and 6c) show a mixture of Co^{2+} and Co^{3+} , the chemical substitution of a particular ion could be achieved. Would this substitution occur in both layers or exclude the Kagome layer? Here we explored the removal of Co^{3+} for Ga^{3+} for the potential formation an isolated magnetically frustrated layered system formed by only Co^{2+} . The synthesis and characterisation of $\text{YBaCo}_{4-x}\text{Ga}_x\text{O}_7$ attempted for $x = 0 - 1.0$ with the structural phase mixtures resolved using powder lab sourced, synchrotron sourced and neutron diffraction techniques.

Level of Expertise

Student

Presenter Gender

Man

Pronouns

He/Him

Do you intend to attend UM2022

Unsure at this stage

Students Only - if available would you be interested in student travel funding

Students Only –Do you wish to take part in the Student Poster Slam

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Yes

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