



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  $\text{YBaCo}_4\text{O}_7$  is a mixed cobalt valence system that exists in a hexagonal arrangement (space group  $P6_3mc$ ), 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  $\text{Co}^{2+}$  and  $\text{Co}^{3+}$ , 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  $\text{Co}^{3+}$  for  $\text{Ga}^{3+}$  for the potential formation an isolated magnetically frustrated layered system formed by only  $\text{Co}^{2+}$ . 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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**Session Classification :** Poster

**Track Classification :** Advanced Materials & Hard Matter