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A structural and magnetic investigation of the skyrmion host material doped Cu2OSeO3

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A skyrmion is a topologically protected particle-like magnetic spin structures on the order of 10-100 nm. Recent studies have also shown that the skyrmions can be manipulated through applications such as an external electric fields and heat. This offers the potential for development for a much more stable, energy efficient and faster storage in memory devices. The magnetic skyrmions pack into a hexagonal lattice with the skyrmion lattice only stable in a narrow magnetic field-temperature range.[1−2] Here we present structural analysis of Cu_2OSeO_3 and Te-doped Cu_2OSeO_3 using neutron and x-ray diffraction. A magnetic field-temperature phase diagram mapping of both Cu_2OSeO_3 and Te-doped Cu_2OSeO_3 was also achieved using small angle neutron scattering. Mapping of the magnetic field-temperature phase diagram showed that tellurium doping resulted in an enlarged stability range for the skyrmion phase had been achieved.[3]

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2. Fert, A.; Reyren, N.; Cros, V., Magnetic skyrmions: advances in physics and potential applications. Nature Reviews Materials 2017, 2, 17031.
3. R. Rov; The Effect of Tellurium Doping on the Skyrmion Hosting Multiferroic Material Cu_2OSeO_3. Masters Thesis, University of Auckland 2019

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Level of Expertise

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