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Inelastic scattering study of AgCrSe2

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Layered triangular antiferromagnet selenide AgCrSe2 (SG : R3m) has been investigated by means of elastic and inelastic neutron scattering, combined with electrical transport, Seebeck coefficient, magnetisation and heat conductivity (kappa) measurements, in the range 5 to 300 K. Below TN = 55 K [1], long-range magnetic ordering is identified, characterized by long-wavelength incommensurate antiferromagnetic cycloids running along [110], and rotating within the ab plane (k = e e 3/2). No structural transition is observed down to 1.5 K, in contrast with structural parent AgCrS2 [2]. Spin wave modelling of the inelastic scattering spectrum in the magnetically ordered phase leads to ferromagnetic and antiferromagnetic exchange interactions between nearest and next-nearest neighbours, respectively, with a weak antiferromagnetic interplane exchange. The most remarkable features of the excitation spectra are a 3 meV phonon with an anomalous temperature behaviour above 80 K, and the persistence of a magnetic signal up to 150 K (~ 3 TN). The presence of this low energy phonon is in agreement with the extremely low thermal conductivity of AgCrSe2, which is attributed to phonon scattering by Ag+ rattling ; on the other hand, the absence of any magnetic field effect (up to 9T) on kappa suggests the absence of any additional contribution to the heat conduction from magnons [3].

[1] Bongers, P. F. et al., Journal of Physics and Chemistry of Solids 29, 977 (1968)
[2] Damay, F., et al., Physical Review B 87, 134413 (2013)
[3] Hess, C., Eur. Phys. J. Special topics 151, 73 (2007)

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