Magnetic instabilities in $K_2Cr_3As_3$

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The magnetic response of a $K_2Cr_3As_3$ sample has been studied by means of dc magnetization measurements as a function of magnetic field (H) at different temperatures ranging from 5 K up to 300 K. Looking at the magnetic hysteresis loops m(H), a diamagnetic behavior of the sample has been inferred at temperatures higher than 60 K, whereas at lower temperatures the sample shows a ferrimagnetic behavior. Moreover, several spike-like magnetization jumps, both positive and negative, have been observed at certain fields in the range -1000 Oe $<$ H $<$ 1000 Oe, regardless of the temperature considered. The field position of the magnetization jumps has been studied at different temperatures, and their distribution can be described by a Lorentzian curve. Finally, a possible explanation of the microscopic mechanisms leading to the presence of these magnetization instabilities has been provided.