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Growth and magnetization dynamics of thin film tetradymite-type diluted magnetic semiconductors based on Sb2-xTMxTe3 (M = V, Cr) ZHENHUA ZHOU, YI-JIUNN CHIEN, CTIRAD UHER, Department of Physics, University of Michigan — Recently we reported on a new MBE-grown thin film ferromagnetic semiconductor based on Sb2-xVxTe3 with a Curie temperature of 177 K when x = 0.35 [1]. Ferromagnetism was confirmed by magnetization measurements and anomalous Hall effect. We have now extended our investigations to thin films of Sb2-xCrxTe3 and we observed ferromagnetism in this system through magnetic measurements. The Curie temperature increases with the increasing concentration of Cr. Ferromagnetic resonance (FMR) was detected in both Sb2-xVxTe3 and Sb2-xCrxTe3 thin films at low temperatures using an electron paramagnetic resonance (EPR) spectrometer. Optical ultrafast spin dynamics investigations in both Sb2-xVxTe3 and Sb2-xCrxTe3 thin films reveal the existence of spin waves in these diluted magnetic semiconductors. The spin wave parameters are obtained based on the FMR and optical methods. [1] Z. Zhou, Y.-J. Chien and C. Uher, Thin film ferromagnetic semiconductors Sb2-xVxTe3 with TC of 177 K, Applied Physics Letters, vol.87, 112503 (2005).

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