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MCD investigation on Mn doped CdSe Quantum Ribbons KRITSANU TIVAKORNSASITHORN, XINYU LIU, MARGARET DOBROWOLSKA, JACEK K. FURDYNA, University of Notre Dame, JUNG H. YU, JIN JOO, DONG W. LEE, JAE S. SON, TAEGHWAN HYEON, JIWON PARK, YOUNG-WOON KIM, Seoul National University — We have successfully incorporated manganese ions into 1.4 nm thick CdSe nanoribbons, thus generating 1-dimensionally quantum confined diluted magnetic semiconductor nanostructures. A series of CdSe:Mn nanoribbons with Mn concentration ranging from 0.7 to 6.4% have been investigated using magnetic circular dichroism (MCD) spectroscopy in order to study spin effects in these CdSe:Mn quantum ribbons. In all samples, a strong MCD signal was found at the energy about 2.9 eV (435 nm), which corresponds to the $1S_h$-$1S_e$ transition, indicating a strong enhancement of the exciton Zeeman splitting due to the $sp-d$ exchange interaction between the CdSe nanoribbon host and the incorporated Mn^{2+} ions. In addition, the magnetic field dependence of the MCD signal obeys a Brillouin function. Finally, we found that the Zeeman splitting energy ΔE calculated from the MCD signal increases with the Mn concentration, which clearly demonstrates that Mn^{2+} ions are indeed present in the CdSe nanoribbons.

Kritsanu Tivakornsasithorn
University of Notre Dame

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