Neutron Study of the Magnetic Structures and Phase Transitions in RCuAs$_2$ (R=Pr, Nd, Tb, Dy, Ho, Yb) YANG ZHAO, Department of Materials Science and Engineering, University of Maryland, College Park, Maryland 20742, USA, J. W. LYNN, NIST Center for Neutron Research, Gaithersburg, Maryland, 20899, USA, GOHIL S. THAKUR, ZEBA HAQUE, L.C. GUPTA, A.K. GANGULI, Department of Chemistry, Indian Institute of Technology Delhi, India — Neutron diffraction and inelastic scattering studies have been carried out on polycrystalline samples of the above titled materials as a function of temperature and applied magnetic field to determine the magnetic structures, order parameters, and overall spin dynamics. The space group of these compound is P4/nmm with typical (tetragonal) lattice parameters $a \sim 3.9$ Å and $c \sim 10.0$ Å. PrCuAs$_2$ develops commensurate magnetic order at $T_N=6.4$ K with an ordered moment of $1.24 \mu_B$ oriented along the c-axis. The ordering wave vector is $(0,0,1/2)$, with a $\Gamma_3$ representation. NdCuAs$_2$ orders at $T_N=3.54$ K with the same ordering wave vector (with the $\Gamma_{10}$ or $\Gamma_2$ representations), but with the moment direction in the a-b plane along [110] of magnitude $3.5 \mu_B$. TbCuAs$_2$ and HoCuAs$_2$ exhibit incommensurate order at $T_N=9.1$ and 4.0 K, respectively. The results for the inelastic scattering will be discussed.

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