NEW MULTINARY RARE EARTH SILICIDES GROWN IN MAGNESIUM/ALUMINUM FLUX. Xiaowei Ma, Susan E. Latturner. Department of Chemistry and Biochemistry, Florida State University, 95 Chieftan Way, Tallahassee, FL 32306.

New multinary rare earth silicides RE_5 $Fe_4Mg_5Al_8Si_{10}$ (RE=Y, Gd, Dy), $Yb_6Fe_2AlSi_{11}$ and $Eu_{6.5}Mg_{16.5}Si_{13}$ have been grown using a 1:1 Mg/Al flux and characterized by single crystal XRD and SQUID magnetometry measurements. RE_5 $Fe_4Mg_5Al_8Si_{10}$ (RE=Y, Gd, Dy) crystallizes in a new P4/mmm symmetry structure (Gd analogue: a=11.7070Å, c=4.0871Å). The structure features Fe-centered trigonal prismatic building blocks. The magnetic data indicate that Gd and Dy phases order antiferromagnetically at T_N=11.87K and T_N=6.87K respectively. The iron atoms do not contribute to the magnetic behavior. Similar trigonal prismatic building blocks are found in $Yb_6Fe_2AlSi_{11}$ phase, which crystallizes in the P4/mbm space group (a=13.3479Å, c=4.0996Å). The effective magnetic moment (μ_{eff}) of Yb ions is calculated as 4.46μB. $Eu_{6.5}Mg_{16.5}Si_{13}$ crystallizes in the $Co_4Hf_2P_3$ type, with space group P-62m and unit cell parameters a=14.6213Å, c=4.4073Å. The magnetic data shows a ferromagnetic ordering at T_c=9K and the μ_{eff} of Eu ions is 8.2μB.