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New Hydrides in the S-Se-P-H system synthesized at High Pressure- High Temperature conditions[1] M. AHART, A. K. MISHRA, M. SOMAYAZULU, C. Y. PARK, Y. MENG, Carnegie Institution of Washington, R. J. HEMLEY, George Washington University — Although S-H system has been proved to be a remarkable high pressure superconductor with the observation of highest T_C ~203 K by Drozdov et al, there is need to stabilize this family of hydrides at lower pressures and explore their superconducting properties. We have studied the analogous Se-H as well as the related solid solutions such as S:Se(50:50)-H, S:P(90:10)-H, S:P(10:90)-H system to realize new materials. In all these systems it has been possible to form hydrogen rich van der Waals compound $(H_2S)_2H_2$ and its analogs at pressures below 10 GPa and 800 K. Synthesis of these compounds are confirmed by XRD and Raman measurements. Some of them have been synthesized at higher pressures utilizing laser heating. We present details spectroscopic measurements as well as synchrotron x-ray diffraction measurements at ambient temperature as well as at low temperatures.

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