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**Collection Efficiency Measurements and Development of a Sample Analysis Station for the OMEGA Gas Sampling System** CHARLES FREEMAN, GEOFF YOUNG, RODNEY ENGELS, SUNY Geneseo, MARK STOYER, G. BRYANT HUDSON, Lawrence Livermore National Laboratory, T. CRAIG SANGSTER, JACK ARMSTRONG, Laboratory for Laser Energetics — The OMEGA Gas Sampling System (OGSS) is a radiochemical diagnostic that can be used to study implosion parameters including shell areal density, mix, and neutron yield in inertial confinement fusion capsules. The OGSS is a prototype for a gas sampling diagnostic which may be installed at the National Ignition Facility. By doping the target capsule with appropriate detector nuclei, nuclear reactions between fusion products and the detector nuclei can produce noble gas isotopes. Following a capsule implosion, these gases are pumped out of the OMEGA chamber and are collected on a cryopump head. Upon regeneration of the cryopump, the OGSS turbopump pumps the gases into up to four 0.5 liter sample collection bottles. The composition of the sample collection bottles is analyzed using either mass spectroscopy or gamma ray spectroscopy. The results of preliminary measurements of the target chamber background and gas sample collection efficiency will be presented. The development of an auxiliary sample bottle analysis station using a residual gas analyzer will also be described. This work was funded in part by the US Department of Energy, the Laboratory for Laser Energetics, and Lawrence Livermore National Laboratory.

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