RAGS: THE GASEOUS SAMPLE COLLECTION DIAGNOSTIC AT THE NATIONAL IGNITION FACILITY*

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Radiochemical diagnostic techniques such as solid- and gas-phase capsule debris analysis may prove to be successful methods for establishing the success or failure of ignition experiments at the National Ignition Facility (NIF). Samples in the gas phase offer the most direct method of collection by simply pumping out the large target chamber following a NIF shot. The target capsules will be prepared with dopants which will produce radioactive noble gas isotopes upon activation with neutrons. We have designed and constructed the Radchem Apparatus for Gas Sampling (RAGS) in order to collect post-shot gaseous samples for NIF capsule diagnostics. The design of RAGS incorporates multiple stages intended to purify, transfer, and count the radioactive decays from gaseous products synthesized in NIF experiments. We will present preliminary results from the RAGS system's commissioning experiments highlighting collection efficiency and transport times. In addition, future improvements including cryogenic collection and purification of analytes and an implementation timeline at NIF will be discussed.

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