

## **Radionuclide Laboratory (IRL): Gas Extraction and Volume Measurement Set-Up**

The radionuclide monitoring network of comprehensive nuclear-test-ban treaty International Monitoring System (IMS) consists of 80 radionuclide stations and 16 radionuclide laboratories. Forty of these stations shall also be capable of monitoring for the presence of relevant noble gases and radionuclide monitoring became the key component of the verification regime. Four xenon radioisotopes of interest are the following:  $^{131m}\text{Xe}$ ,  $^{133m}\text{Xe}$ ,  $^{133}\text{Xe}$  and  $^{135}\text{Xe}$ . In some cases after analysis of air extracted radionuclide isotopes, the archive bottle of xenon system needs to be re-measured by laboratories to confirm the results. Laboratory system shall include noble gas extraction, precise volume and activity measurement equipment. Islamic Republic of Iran Radionuclide Laboratory (IRL) has been designed and established with radionuclide analysis capability. This Paper is focused on design and implementation of gas extraction and volume measurement parts of the system and presents its performance based on the inter-comparison exercise and standard sample analysis results.

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