



Contribution ID: 7

Type: **Poster**

On the automation of the chemical experiments with radionuclides at ISOLDE (SSP)

First wet-chemical experiments with Mn-57 were successfully conducted at ISOLDE in June 2017. These experiments comprised multiple steps: placement of a piece of metallic foil in the implantation chamber followed by its evacuation, accumulation of Mn-57 by ion-implantation into the foil, vacuum release and removal of the foil from the chamber, package and transportation of the foil to the chemical lab, unpackage the foil, dissolution of manganese in acid followed by the additions of chemicals to transform manganese into the desired chemical form, preparation of a sample for Moessbauer measurement including freezing of a solution, measurement, radioactivity waste and preparations for the repetition. Thus, the experiments required concerted efforts of several men. But the critical problem was the time necessary for the manipulations, because the live-time of Mn-57 is very short (85s) and most of the accumulated activity was lost before it was involved into a chemical reaction.

To constrict the time lost, to improve the radiation safety, and to increase the efficiency of the experiments, we consider the automation of all steps of the experimental procedure.

The fast insertion and removal of the sample (substrate) into/from the implantation space without vacuum release can be performed by a valve mechanism, which animated sketch is presented at www.happysloth.ru/ISOLDE. All manipulation with the liquid chemicals can be realized based on standard automated laboratory dosing equipment. (We are realizing this step on the base of laboratory devices of Metrohm AG (Switzerland), including 730 Sample Changer, 800 Dosinos driven by 809 Titrando, and operated by Tiamo software.) This equipment is also responsible for the transfer of the ready-to-measure liquid sample to desired place for freezing, for sucking-out the unfrozen sample after the measurement, and for rinsing as well.

The described set-up can be enclosed into a thick-wall plastic aquarium ensuring protection from ionizing radiation and any liquid leakages.

Author: Dr DEDUSHENKO, Sergey

Presenter: Dr DEDUSHENKO, Sergey

Session Classification: Poster Session