Contribution ID: **185** Type: **Poster**

Study of new filter properties ¹³⁷Cs vapour capture at high temperature

Thursday, 22 April 2010 12:00 (20 minutes)

Vitrification of radioactive wastes and high temperature synthesis of glass and ceramics for ionizing radiation sources, containing Cs-137, is accompanied by discharge of its vapours. The off-gas contaminated by Cs-137 must be cleaned up using different trapping systems.
In general two methods of Cs-137 vapour catching are possible, differing both in process character (nature) and realization place in technological scheme:
·"wet" method –"low-temperature" Cs-137 vapour condensation in system of gas cleaning (condensers, scrubbers, HEPA-filters). This method leads to contamination of communications and to formation secondary liquid RAW, which require additional repossessing.
·"dry" method –"high-temperature" Cs-137 vapour chemisorptions. This method allows fixing Cs-137 in stable crystalline and amorphous phases.
Earler it was shown that porous inorganic materials with high content of silica- alumina amorphous phase could be used for effective capturing of Cs-137 vapours. Effectiveness of filter depends on the total porosity; porous structure and aerodynamic resistance to off-gas flow. To study these parameters a laboratory scale test facility was built at the KRI.
The following three methods are used to evaluate dust and aerosol capture efficiency at room temperature:
·weighing method: sample the dust using special certificated analytical filters followed by weighing of the absorbed precipitate. The filters are sealed in the filter holders;
·radiometric method: if an isotope spike is used, the dust is sampled using the analytical filters as described above followed by measurements of absorbed activity using conventional methods;
·aerosol particle concentration measurements: using laser counters for aerosol particle concentrations. This method determines fraction decontamination factors for the particle sizes ranging from 0.2 to 5 μm.
Report will summarize obtained analytical data and describe the dependence of filter effectiveness at different rates off-gas flow.

Primary author: Dr ALOY, Albert (Khlopin Radium Institute)

Co-author: Mrs SHASMOLOVA, Irina (Khlopin Radium Institute)

Presenter: Dr ALOY, Albert (Khlopin Radium Institute)

Session Classification: Poster Session - Chemistry of Nuclear Fuel Cycle, Nuclear Waste Management

Track Classification: Chemistry of Nuclear Fuel Cycle, Radiochemical Problems in Nuclear Waste Management