

Symposium on Nuclear Data 2020

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|-----------------|-----------------|-------------------|------------------|----------------------------|--------------------|-------------------|---------------------|---------------------|------------------|------------------|
| Ag102 12.9 m | Ag103 65.7 m | Ag104 69.2m | Ag105 41.29 d | S ymposium on | Ag107 51.839 % | Ag108 2.37 m | Ag109 48.161 % | Ag110 24.6 s | Ag111 7.45 d | Ag112 2.135 h |
| Pd101 8.47 h | Pd102 1.02 % | Pd103 16.991 d | Pd104 11.14 % | Pd105 22.33 % | N uclear | Pd107 6.5e+4 y | Pd108 26.46 % | Pd109 15.700(26) | Pd110 11.72 % | Pd111 23.4 m |
| Rh100 20.8 h | Rh101 3.3 y | Rh102 2.72 s | Rh103 100 % | Rh104 42.3 s | Rh105 35.95 h | D ata | 2020 Nov. | Rh108 9.0 m | Rh109 99 s | Rh110 3.3 s |

Contribution ID: 54

Type: **Poster Presentation**

Measurement of neutron total cross sections of Sn-Pb alloys in solid and liquid states / 固体と液体状態での Sn-Pb 合金の全断面積測定

Thursday, 26 November 2020 17:12 (1h 38m)

Recently, a small modular reactor (SMR) with inherent and passive safety has been receiving attention all over the world. In Japan, a very small modular reactor, namely, MoveLuXTM (Mobile-Very-Small reactor for Local Utility in X-mark) has been developing by Toshiba Energy Systems & Solutions Corporation. MoveLuXTM is a thermal reactor that uses a calcium hydride as a neutron moderator. The use of a Sn-Pb alloy as an in-core heat transport medium is being considered. The Sn-Pb alloy is in a solid state when the reactor is started, and becomes liquid since the core temperature reaches 660°C during operation. Therefore, the total cross section data of the Sn-Pb alloy is important for evaluating the effect of the change in the total cross section depending on the state of Sn-Pb alloy on the reactor characteristics. However, there are no reports on experimental data for total cross section of Sn-Pb alloys in both solid and liquid states in spite of the fact that it is important data for nuclear engineering. In the present study, the neutron total cross section was obtained from neutron transmission measurements by the time-of-flight (TOF) method using the Kyoto University Institute for Integrated Radiation and Nuclear Science –Linear Accelerator (KURNS-LINAC). The sample temperature was changed from room temperature (solid) up to 300°C (liquid). The total cross sections of solid and liquid states were compared and the change in Bragg edge due to the difference of crystal structure was observed in the energy region below 0.01 eV. Comparing the total cross sections of the solid and the solid resolidified after melting, it was confirmed that some Bragg edges, which are thought to be due to the crystal structure of Pb, disappeared by the resolidification. At the poster presentation, the detail of the total cross section measurement experiment and the results obtained so far will be discussed.

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