RCNP EXPERIMENT E

PROPOSAL FOR EXPERIMENT AT RCNP

2 March 2018

TITLE:
Development of new analysis method for origin identification of archaeological remains with muonic X-rays

SPORKESPERSON:

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Title or Position	Assistant Professor
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EXPERIMENTAL GROUP:

Full Name	Institution	Title or Position
Akira SATO	Osaka University	Assistant Professor
M. Kenya KUBO	International Christian University	Professor
Kazuhiko NINOMIYA	Osaka University	Assistant Professor
Dai Tomono	RCNP, Osaka University	Assistant Professor

RUNNING TIME:

Installation time without beam	0.5 days(for each beam time)
Development of device	0 days
Test running time for experiment with beam	0.5 days
Data runs with beam	4.5 days
Total beam time	5.0 days

BEAM LINE: Ring : WSS course

BEAM REQUIREMENTS:

Type of particle	proton
Beam energy	392 MeV
Beam intensity	1.1 μA
Other requirements	-

BUDGET: Experimental expenses 0 yen

SAFETY CONTROLLED ITEMS:
- non

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SUMMARY OF THE PROPOSAL

The purpose of this experiment is to apply the method of the non-destructive non-contact element analysis by muonic characteristic X-rays to archaeological materials. This is the basic research for making it sublimate to local identification research and manufacture technical research. Muonic characteristic X-rays are useful to research of cultural properties including the archaeological materials which must avoid the damage by destructive analysis. Substance analysis of archaeological materials is not the purpose only in order to know an ingredient. Substance analysis offers the foundational data for thinking of how human beings produced the tool. Moreover, substance analysis is effective also in considering what kind of intention selection of a material had.

In this experiment, I analyze the stoneware in which local identification research is advanced by componential analysis and isotopic ratio analysis also in archaeological materials. In this experiment, beforehand, with fluorescence X-rays equipment, I measure the amount of ingredients and perform accuracy verification through comparison with the measured value of muonic characteristic X-rays. In this experiment, beforehand, with fluorescence X-rays analysis, I measure the amount of ingredients and perform accuracy verification through comparison with the measured value of muonic characteristic X-rays. Moreover, I serve also as the foundational experiment for establishing a new local identification method also paying attention to the content situation of the light element which was not able to be extracted in fluorescence X-rays analysis, and isotopic ratios. I use experiment data as local data and a ruins archaeological find, and advance local identification research positively by comparing both of analytical data.