

PROPOSAL FOR EXPERIMENT AT RCNP

14 February 2016

TITLE:

Development of muonic X-ray measuring system and precise determination of muon capture probabilities for iron compounds

SPOKESPERSON:

Full Name	Kazuhiko Ninomiya
Institution	Graduate School of Science, Osaka University
Title or Position	Assistant Professor
Address	1-1, Machikaneyama, Toyonaka, Osaka, Japan
Phone number	+81-6-6850-5416
FAX number	+81-6-6850-6999
E-mail	ninokazu@chem.sci.osaka-u.ac.jp

EXPERIMENTAL GROUP:

Full Name	Institution	Title or Position
Kazuhiko Ninomiya	Osaka University	Assistant Professor
Atsushi Shinohara	Osaka University	Professor
Makoto Inagaki	Osaka University	Graduate Student
Go Yoshida	Osaka University	Graduate Student
Akihiro Nanbu	Osaka University	Graduate Student
Akira Sato	Osaka University	Assistant Professor
Kenya Kubo	International Christian University	Professor
Taniguchi Akihiro	Kyoto University	Associate Professor

RUNNING TIME:	Installation time without beam	2 days(for each beam time)
	Development of device	0.5 days
	Test running time for experiment	0.5 days
	Data runs	8 days

BEAM LINE: Ring : WS course

BEAM REQUIREMENTS:	Type of particle	proton
	Beam energy	400 MeV
	Beam intensity _	20 nA

BUDGET: Experimental expenses 0 yen

SAFETY CONTROLLED ITEMS:

- beryllium, equipped in HPGe detectors as a vacuum window

TITLE:

Development of muonic X-ray measuring system and precise determination of muon capture probabilities for iron compounds

SPOKESPERSON: Kazuhiko Ninomiya

SUMMARY OF THE PROPOSAL

The muonic atom has a possibility for non-destructive elemental analysis for bulk material by X-ray measurement and for investigating chemical environment by mu-SR method. However, to utilize muonic atom in various application field, the knowledge on the process of muonic atom formation is still limited. Fundamental data, such as, absolute muonic X-ray emission rates, muon capture probabilities and the influences on them by chemical environment of muon capturing atom, have strong needs of complication. In RCNP-MuSIC, intense negative DC muon beam are now in available, and study on the muonic atom formation process is possible. In this study, we will develop a measuring system of muonic X-rays, and measure muonic X-rays for various iron compounds to expand muonic atom research in the application field.