SANDA WP3
Task 3.3: Target production

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- Target requests
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- Some examples of prepared targets

Task 3.3: Target production

- Task coordinator: JRC, partners: PSI
- Target requests related to energy and non-energy applications are considered.
- During the first 12 months of the project, target requests from collaborators were collected.

Target requests

	SANDA Domain other	Target user					Target production		
		Spokeslab.	Facility	Date experiment	Target request	Request sent to	Target producer	Status of target preparation	Delivery
Ta-179		Ruchi Garg et al. University of Edinburgh, UK ruchi.garg@ed.ac.uk			Extraction of Ta-179	PSI	PSI	Work in progress	
Pb-205		Adrià Casanovas Universitat Politècnica de Catalunya (UPC) adria.casanova@upc.edu	CERN n_TOF			PSI	PSI	Realization under discussion	
Se-79		V. Babiano Instituto de Física Corpuscular (IFIC), Spain vbabiano@ific.uv.es	CERN n_TOF		PbSe on a support foil Isolating Se from PbSe	PSI	PSI	Work in progress	
Ho-163		C. Guerrero Univ. Sevilla & CNA, Spain cguerrero4@us.es	CERN n_TOF		^{163}Ho target of at least 5 mg	PSI	PSI	Not very realistic	

Target requests

		SANDA Domain other	Target user					Target production		
			Spokeslab.	Facility	Date experiment	Target request	Request sent to	Target producer	Status of target preparation	Delivery
	Pu-239	SANDA 2.2.1	Daniel Cano-Ott et al. CIEMAT, Spain daniel.cano@ciemat.es	CERN n_TOF		10x ^{239}Pu 320-330 µg/cm^2 + 1x ^{239}Pu 100 µg/cm^2 Ø20mm on 20 µm thick Al foil	JRC-Geel	JRC-Geel	Preliminary on-going	Jan-March 2022
						1x ^{239}Pu target of 100 mg			Realization under discussion	Jan-March 2022
	Pu-242		Beatriz Jurado et al. CENBG, France jurado@cenbg.in2p3.fr	IPNO France		on 100 µg/cm² thick C-nat foil	SANDA/WP3		Project withdrawn from SANDA	NA
	U-238	SANDA 1.2.3	Gilbert Bélier et al. CEA/DAM-DIF gilbert.belier@cea.fr	NFS France		4x ^{238}U 350 µg/cm^2 (total 10 mg ^{238}U) Ø30mm on aluminized 70-80 µg/cm^2 PI foil	JRC-Geel	JRC-Geel CEA	On-going	July-Sept 2021
						40 µg/cm2 PI foil on ring Øout 60mm Øin 40mm			On-going	July-Sept 2021

Pending target requests

	SANDA Domain other	Target user					Target production		
		Spokeslab.	Facility	Date experiment	Target request	Request sent to	Target producer	Status of target preparation	Delivery
U-235		Alexander Prokofiev et al. Uppsala, Sweden alexander.prokofiev@physics.uu.se	NFS France		3x ^{235}U 400 µg/cm^2 Ø25mm on 40 µg/cm^2 PI foil	CHANDA/WP3 SANDA/WP3	JRC-Geel	Delay on installation of new U235 evaporator because of COVID-19	May-June 2022?
U-238		Alexander Prokofiev et al. Uppsala, Sweden alexander.prokofiev@physics.uu.se	NFS France		3x ^{238}U 400 µg/cm^2 Ø25mm on 40 µg/cm^2 PI foil	CHANDA/WP3 SANDA/WP3	JRC-Geel	Targets prepared and characterized	Okt.-Nov. 2021
					3x 40 µg/cm^2 PI foil on 1mm thick Al-ring $Ø_{out}$ 90mm $Ø_{in}$ 70mm	CHANDA/WP3 SANDA/WP3	JRC-Geel	On-going	July-Sept 2021
Pu-239	SANDA T2.3	Maëlle Kerveno et al. CNRS IPHC France maelle.kerveno@iphc.cnrs.fr	GELINA JRC-Geel		4x ^{239}Pu pellets (total 2g ^{239}Pu)	JRC-Geel	JRC-Geel	Transport to JRC-Karlsruhe for purification delayed because of COVID-19 Looking for a solution	delayed
Am-241	SANDA T2.1.1	zinovia.eleme@cern.ch	CERN n_TOF		6x ^{241}Am 5 µg/cm2 Ø60mm on 25 µm thick Al foil	JRC-Geel	JRC-Geel	Targets back from experiment γ-spectrometry on-going	2021
Th-230	SANDA T2.1.1	veatriki.michalopoulou@cern.ch	CERN n_TOF		7x ^{230}Th 100 µg/cm2 Ø80mm on 25 µm thick Al foil	JRC-Geel	JRC-Geel	Targets back from experiment α- and γ-spectrometry on-going	2021

Examples

$^{7}Be(NO_3)_2$ layer by drop deposition

Backing

0.635 µm thick polyethylene film

Deposit

$Be(NO_3)_2$ thickness: 0.36 µm

^{7}Be activity: 24.5 GBq

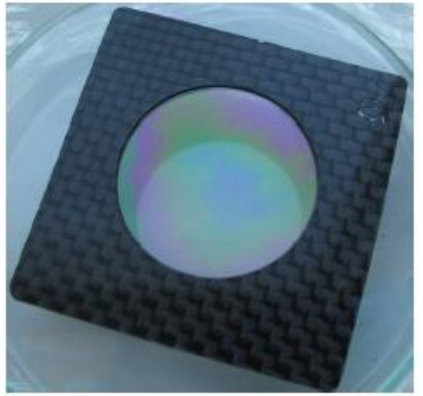


Figure 2. sLD-PE film glued onto a carbon fibre frame.

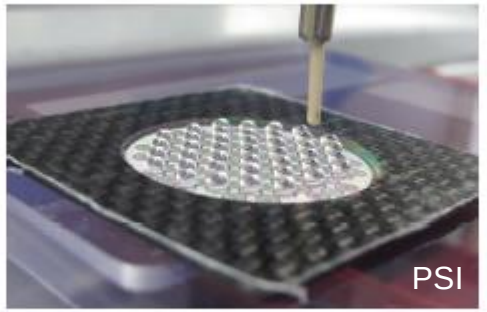


Figure 4. Droplets of $Be(NO_3)_2$ 0.01 M HNO_3 placed onto the sLD-PE film.

E.A. Maugeri et al., Preparation of ^{7}Be targets for nuclear astrophysics research, 2017 JINST, Published by IOP Publishing for Sissa Medialab

Examples

Implantation of ^{7}Be into aluminium foils

Backing

50 × 50 × 0.018 mm Al foil
placed between two Al frames
with a 40 mm diameter central hole

Implantation

^{7}Be activity: 1 GBq

Fig. 3. Panel (a): Target_1 GBq

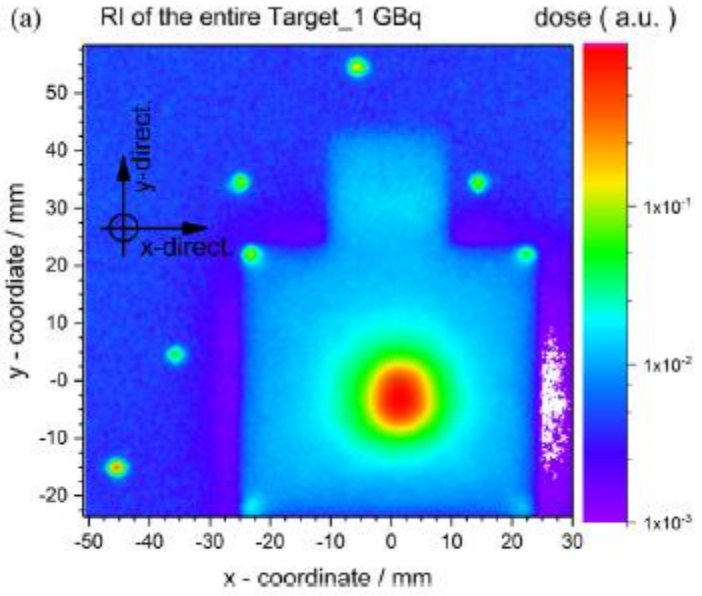


Fig. 4. Panel (a): Two-dimensional radiographic image of Target_1 GBq. Pane

E.A. Maugeri et al., Preparation and characterization of three ^{7}Be targets for the measurement of the ^{7}Be(n, p)^{7}Li and ^{7}Be(n, α)^{7}Li reaction cross sections, Nuclear Inst. and Methods in Physics Research, A 889 (2018) 138–144

Examples

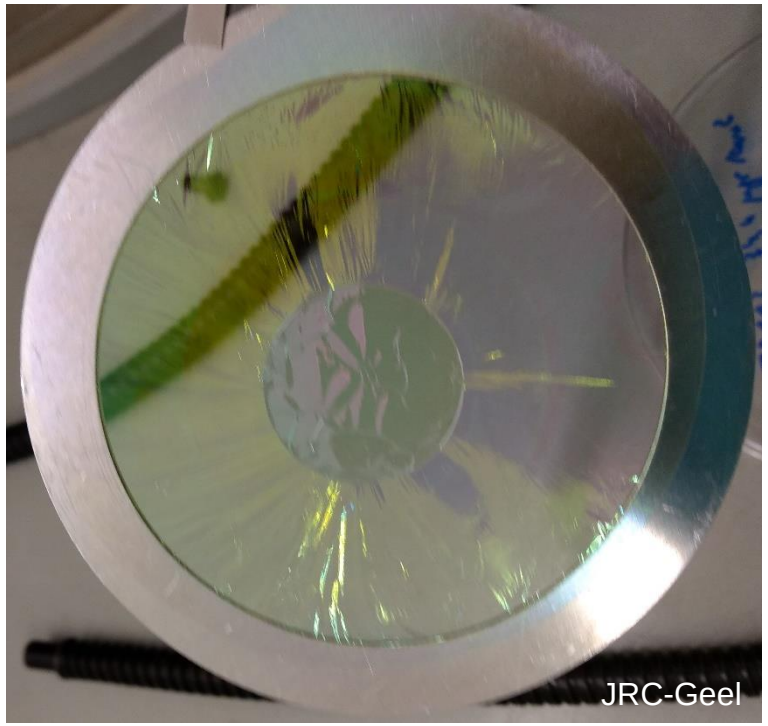
$^{238}UF_4$ deposit by vacuum evaporation

Backing

34 µg/cm^2 polyimide foil
on 1 mm thick Al ring $Ø_{out}$ 90 mm $Ø_{in}$ 70 mm

Deposit

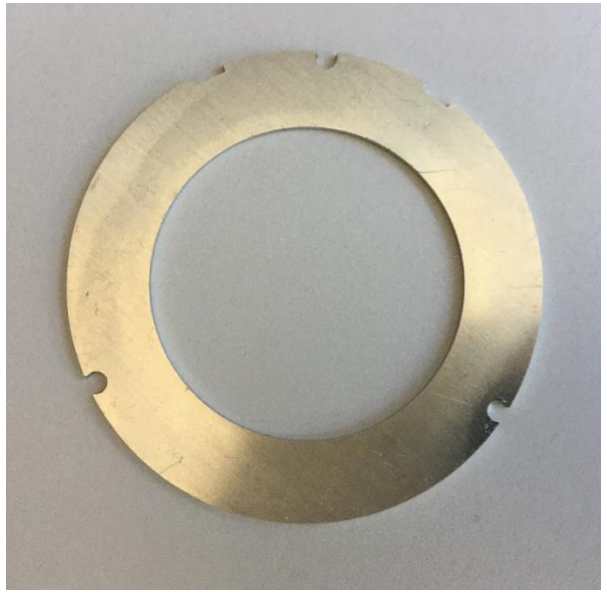
^{238}U diameter: 20 mm
^{238}U areal density: 377 µg/cm^2
^{238}U mass:1.84 mg



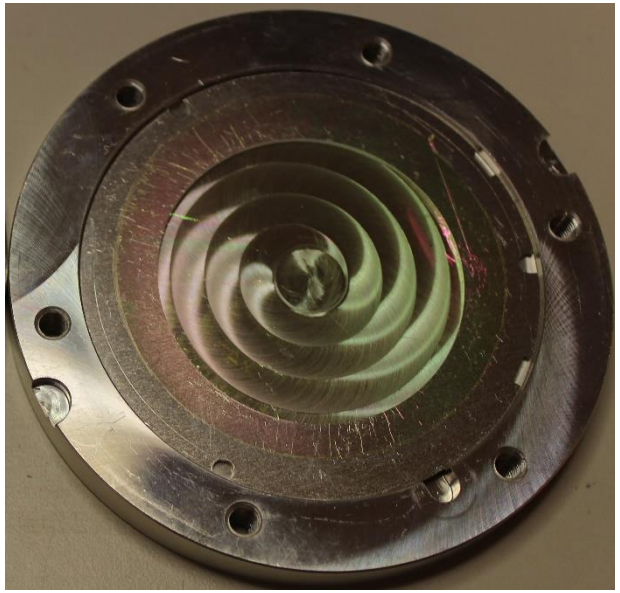
Examples

Backings for target request 4x ^{238}U 350µg/cm^2 Ø 30mm (SANDA T1.2.3)

1mm thick Al ring
$Ø_{out}$ 60mm $Ø_{in}$ 40 mm (JRC-Geel)



+ 62 µg/cm^2 PI foil (JRC-Geel)



+ 87 nm Al deposit (CEA)

SANDA
target request form

Target request to be sent to
Dorothea Schumann
dorothea.schumann@psi.ch
Goedele Sibbens
goedele.sibbens@ec.europa.eu

SANDA
Supplying Accurate Nuclear Data for energy and non-energy Applications
HORIZON2020

TARGET PREPARATION REQUEST FORM	TP
Title of the proposal	
Lead User (name, address, phone, e-mail)	
Description of the planned experiment **SANDA WP n°:** **Other: (add max 1 page)**	**Preferred Target laboratory** **Specifications of the target** **Quantity:** **Material** Composition: Delivered by requestor: Y/N Areal density or thickness: Size: **Backing** Material: Delivered by requestor: Y/N Thickness: Size: **Target characterisation** Isotopic composition: Y/N Requested accuracy: Activity: Y/N Requested accuracy: Mass: Y/N Requested accuracy: Areal density: Y/N Requested accuracy: Dimensions: Y/N Requested accuracy: Homogeneity: Y/N Requested accuracy:
Location of experiment	
Expected delivery date	
Did you include declaration of licensing and end-user statement in your planning? Y/N **Is the location of experiment licensed to receive the material?** Y/N **If yes, add the declaration of licensing and end-user statement.**	
Contact person (e-mail) at SANDA	

Date ……

Signature of Lead User ……

This proposal must be submitted by e-mail to the following addresses:
goedele.sibbens@ec.europa.eu
dorothea.schumann@psi.ch

European Commission

Thank you

Goedele Sibbens
EC-JRC Geel, Belgium
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European Commission