

AE-494: Power measurment of 470 nm UHP in robot setup

Date: 2025-05-19
Tags: Radiation Test AE HTE Power measurement
Category: HTE
Status: Done
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Literature/reference experiments

Literature	/
Reproduction	/
Similar experiments	AE-341: Power measurment with different power settings from Joy-It with 470 nm

Irradiation Parameters

Power measured using [Power Meter] 843-R-USB + 919P-020-12 unless specified otherwise.

	Name
Used Set-up (select one)	Protocol - Operation of automated workflow for investigation of oxygen evolution - as of 03.07.2024

	Light Source Name	Wavelength [nm]	Power Setting [mW]
First light source	Light Source - UHP LED 470 nm	470	/

Used beam combiner [Name or None]	none
Irradiation distance [cm]	8.5
Thermostat temperature [°C]	none
Stirring speed [rpm]	none

Procedure/observations

Date	Time	Step	Observations	Pictures
16.05	11:40	In the robot (set up of hardware according to Protocol - Operation of automated workflow for investigation of oxygen evolution - as of 03.07.2024) instead of the reactor the Power sensor of Power Meter - 843-R-USB + 919P-020-12 . The programmable power supply was adjusted manually	/	setup in robot.jpg
	11:58	The programmable power supply was set to 0.18 V	0.109 W	during irradiation.jpg
	12:34	/	0.112 W	/
	12:35	The programmable power supply was set to 0.80 V	0.430 W	/
	12:39	/	0.432 W	/
	12:39	The programmable power supply was set to 0.08 V	0.058 W	/
	12:41	/	0.057 W	/
	12:41	The programmable power supply was set to 0.12 V	0.081 W	/
	12:43	/	0.081 W	/
	12:43	The programmable power supply was set to 0.30 V	0.175 W	/
	12:45	/	0.174 W	/
	12:45	The programmable power supply was set to 0.18 V	0.112 W	/
	12:48	/	0.112 W	/

Analysis

For obtained data see observations

For calculations: [AE-494341.xlsx](#)

Ratio between measured value and value measured at 0.18 V:

Setting [V]	Determined ratio [-]	Comparison to data from AE-341: Power measurement with different power settings from Joy-It with 470 nm	Deviation between both experiments [%]
0.08	0.513	0.518	-0.86
0.12	0.723	0.728	-0.61

0.18	1.000	1.000	0.00
0.30	1.558	1.545	0.87
0.80	3.848	3.812	0.94

Results

In general higher power measured than in [AE-341: Power measurement with different power settings from Joy-It with 470 nm](#)

Ratios between different settings nearly identical with error always below 1 %

Linked experiment

- [AE-341: Power measurement with different power settings from Joy-It with 470 nm](#)

Linked items

Light Source - [UHP LED 470 nm](#)

Power Meter - [843-R-USB + 919P-020-12](#)

Protocol - [Operation of automated workflow for investigation of oxygen evolution - as of 03.07.2024](#)

Attached files

AE-494341.xlsx

sha256: 1aa698b14f7f811d861e6cd66f11384f297e8bbbc042129cf4013a23fa517e32

during-irrad.jpg

sha256: 20b3299efebfd9278115da705d0d9fee811b279b405d57edf28bacf1408014c8



setup-in-robot.jpg

sha256: bf89bae57465b23dcacb94233e28ebc274982111dc87ecea69843f675e4840df



Unique eLabID: 20250519-ac31cd01dadca5015e8813934f4743a59b0ad18a
Link: <https://elab.water-splitting.org/experiments.php?mode=view&id=2179>