AE-404: Manufacturing, Test and calibration of HTE vial with O2 and T spot

Date: 2024-12-12
Tags: O2 | AE | Calibration | Irradiation | Irradiation setup
Category: HTE
Status: Done
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Literature	/
Reproduction	/
Related experiment	Experiment - MLB-118: Production of NS14 cap with O2 and temperature optical sensor spots Experiment - JSC-622: HTE vial for O2 measurements HTE - AE-356: Test and calibration of new vial for O2 and T measurment in HTE setup Organisational - AE-373: Test and calibration of O2 cap I for O2 and T measurment in irrad setup HTE - AE-392: Calibration of O2 vial for O2 and T measurment in irrad setup I

Reagents

Name	**CAS Number / Experiment Number**	**Inventory number**	**Amount [mmol]**	concentration used	**Molar mass [g/mol]**	**Volume [ml]**	obtained concentration
Milli-Q water	/	/	/	/	/	7.52 mL	/
Sodium carbonate (anhydrous) solution	HTE - AE-383: Preparation of stock solutions for the irradiation of [Ru(bpy)3]Cl2 * 6 H2O	/	0.267	0.8 M	105.988	0.334	0.0314 M
Sodium bicarbonate solution	HTE - AE-383: Preparation of stock solutions for the irradiation of [Ru(bpy)3]Cl2 * 6 H2O	/	0.583	0.9 M	84.006	0.648	0.0686 M

Procedure/observations

Date	**Time**	**Step**	**Observations**
11.12	9:30 - 9:50	A PyroScience trace range oxygen sensor spot as well as a PyroScience optical temperature sensor spot were glued into a 10 mL HTE vial	

	11:20	A holder for the glas fiber cable (from Pyro science) was glued on the outside of the vial (silicone glue from PyroScience) at the same place at the Temperature sensor spot	
	14:15	A holder for the glas fiber cable (from Pyro science) was glued on the outside of the vial (silicone glue from PyroScience) at the same place at the O2 sensor spot	
	17:30	The holders were secured with more glue	
		The glue was allowed to harden over night in the dark at rt	
12.12		The Temperature measurement spot and oxygen measurment spot of the cap were connected to the firesting with a glas fiber cable.	
	10:15	The vial Milli-Q water and Na2CO3 and NaHCo3 were added	
	10:28	The PT100 was placed inside the cap through the GL14 opening at the top and connected to the Firesting	
	10:35	The temperature calibration was done	signal intensity: 152
	10:36	The PT100 was removed	
	10:38 - 10:45	The upper calibration for oxygen content was done by bubbling comprassed air through the water	
	10:45 - 10:46	The flask and tubing were flushed with argon	
	10:47 - 11:33	The lower calibration for oxygen content was done by bubbling argon through the water	signal intensity: 278,
		The flask was closed	

Results

Worked, good intensity

241212_Instruments_Settings_HTE_Vial_Liquid_Phase.ini

Future recommendations

Old procedure	Problem	Suggested new procedure

Linked experiments

- AE-JSC-309: Manufacturing and calibration of new 10 mL HTE with sensor spots

- AE-320: Test and calibration of Temperature spot from AE-300

- AE-JSC-321: Manufacturing and calibration of new 10 mL HTE with sensor spots I

- AE-354: Preparation of stock solutions for the irradiation of [Ru(bpy)3]Cl2 * 6 H2O

- AE-355: Test and calibration of Temperature spot from AE-JSC-321

HTE - AE-356: Test and calibration of new vial for O2 and T measurment in HTE setup

HTE - AE-392: Calibration of O2 vial for O2 and T measurment in irrad setup I

Organisational - AE-370: Manufacturing, Test and calibration of O2 cap 2 for O2 and T measurment in irrad setup

Organisational - AE-373: Test and calibration of O2 cap I for O2 and T measurment in irrad setup

Organisational - AE-390: Manufacturing, Test and calibration of O2 with GL14 for O2 and T measurment in irrad setup

Attached file

241212_Instruments_Settings_HTE_Vial_Liquid_Phase.ini
sha256: a6cd38c0d11c2606bb3ab08c0aebb16c367a4ac287c2b8893c5fc9bd84e233c0

Unique eLabID: 20241212-98b99f3198ae5c8e53d62acfa54056432a877615
Link: https://elab.water-splitting.org/experiments.php?mode=view&id=1577