

AE-334: Preparation of stock solutions for the irradiation of [Ru(bpy)₃]Cl₂ * 6 H₂O

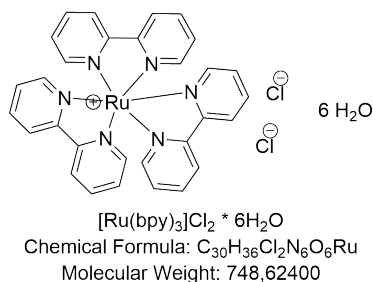
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Tags: [Ru(bpy)₃]Cl₂*6 H₂O Stocksolution AE HTE

Status: Done

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Reaction scheme/sample structure



Chemical Formula: CHNaO₃
Molecular Weight: 84,00577

Na₂S₂O₈
Chemical Formula: Na₂O₈S₂
Molecular Weight: 238,09154

NaHCO₃

Na₂CO₃
Chemical Formula: CNa₂O₃
Molecular Weight: 105,98754

H₂O
water
Chemical Formula: H₂O
Molecular Weight: 18,01500

Literature/reference experiments

Literature	https://doi.org/10.1021/acscatal.6b02595
Reproduction	/
Related experiment	Experiment - AE-323: Preparation of stock solutions for the irradiation of [Ru(bpy) ₃]Cl ₂ * 6 H ₂ O

Reagents

Name	Abbriviation	CAS Number / Experiment Number	Amount [mmol]	Mass _{theo} [mg]	V _{theo} [μL] 25 % in water	Mass _{exp} [mg]	Molar mass [g/mol]	Volume of water to be added [ml]	Obtained concentration
[Ru(bpy) ₃]Cl ₂ * 6 H ₂ O	Ru	50525-27-4	3 μmol	2.245	/	2.28	748.62	15.23	0.04 mM
[Ru(bpy) ₃]Cl ₂ * 6 H ₂ O	Ru new	50525-27-4	3 μmol	2.245	/	2.19	748.62	14.63	0.04 mM
Sodium persulfate	Ox	7775-27-1	1.5	357.14	/	357.12	238.09	20	60 mM
Sodium persulfate	Ox new	7775-27-1	1.5	357.14	/	357.29	238.09	20	60 mM
Essigsäure	OAc	64-19-7	0.835	50.14	/	51.22	60.05	together in 10.21	0.0835 M
Natium acetate	OAc	127-09-3	9.17	768.42	/	768.40	82.03		0.917 M

Essigsäure	OAc new	64-19-7	0.835	50.14	/	52.41	60.05	together in 10.45	0.0835 M
Natium acetate	OAc new	127-09-3	9.17	803.21	/	803.10	82.03		0.917 M
KH ₂ PO ₄ (anhydrous)	KPO4-1	7778-77-0	9.42	1282.0	/	1282.36	136.09	together in 10	0.942 M
K ₂ HPO ₄ (anhydrous)	KPO4-1	7758-11-4	0.584	101.74	/	102.45	174.18		0.0584 M
KH ₂ PO ₄ (anhydrous)	KPO4-2	7778-77-0	0.652	88.77	/	88.69	136.09	together in 10	0.0652 M
K ₂ HPO ₄ (anhydrous)	KPO4-2	7758-11-4	9.35	1628.6	/	1625.93	174.18		0.935 M
NH ₄ Cl	NH3-1	12125-02-9	9.42	503.89	/	504.30	53.49	together in 10	0.942 M
NH ₃	NH3-1	7664-41-7	0.575	9.79	39.2	/	17.03		0.0575 M
NH ₄ Cl	NH3-2	12125-02-9	1.60	85.32	/	85.53	53.49	together in 10	0.160 M
NH ₃	NH3-2	7664-41-7	8.61	146.5	586	/	17.03		0.861 M
sodiumhydrogen carbonate	HCO ₃	144-55-8	9.00	756.05	/	755.59	84.006	10	0.9 M
Na ₂ HPO ₄	NaPO ₄	7558-79-4	9.42	133.67	/	133.78	141.96	10	0.942 M
NaOH	OH	1310-73-2	8.25	329.98	/	328.79	40.00	15	0.55 M

Procedure/observations

Date	Time	Step	Observations
06.08	09:50 - 10:25	Each chemical, besides NH ₃ was weight in a 15 mL snap-on cap vial with the abbreviation stated in the reagents table, besides Na ₂ S ₂ O ₈ , which was weighed in a 50 mL snap-on cap vial. And besides the solids labeled with new in the reactents table	The vials were labeled with the abbreviation stated in the reagents table
	13:30	To each vial Milli-Q water (amount sepecified in reagents table) was added using a 2 figure scale	The obtained concentrations are stated in the observation table
	13:45	To the vials labled NH ₃ ammonia solution (amount stated in reagents table) was added using a suitbale Eppendorf pipette (either 100 µL or 1 mL)	
	13:50	All vials were vortex till homogeneous solutions were obtained.	
	15:30	Each solution was transferrred into a ChemSpeed robot vial and closed with a plastic stopper, besides NaPO ₄ and OH solution and the remaining amounts of Ru and Ox solution.	
		The Ru vials were subsequently wrapped in aluminium foil	

07.08	8:00	The solids labeled new in the abbreviation column of the reactents table were weighed in a 15 mL snap-on cap vial with the abbreviation stated in the reagents table, besides Na ₂ S ₂ O ₈ , which was weighed in a 50 mL snap-on cap vial	
	8:15	To each vial Milli-Q water (amount specified in reagents table) was added using a 2 figure scale	
	8:20	All vials were vortex till homogeneous solutions were obtained.	
		The Ru vial were subsequently wrapped in aluminium foil	

Linked experiments

- AE-265: Preparation of stock solutions for the irradiation of [Ru(bpy)₃]Cl₂ * 6 H₂O

- AE-270: Preparation of stock solutions for the irradiation of [Ru(bpy)₃]Cl₂ * 6 H₂O

- AE-311: Preparation of stock solutions for the irradiation of [Ru(bpy)₃]Cl₂ * 6 H₂O I

- AE-323: Preparation of stock solutions for the irradiation of [Ru(bpy)₃]Cl₂ * 6 H₂O

Attached file

AE-334-MRG-059-ZA.xlsx

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Link: <https://elab.water-splitting.org/experiments.php?mode=view&id=1267>