

# AE-405: Preparation of stock solutions for the irradiation of [Ru(bpy)<sub>3</sub>]Cl<sub>2</sub> \* 6 H<sub>2</sub>O I

Date: 2024-12-12

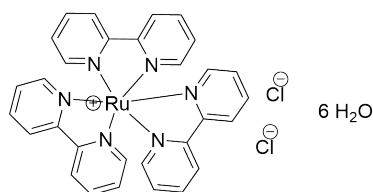
Tags: [Ru(bpy)<sub>3</sub>]Cl<sub>2</sub>\*6 H<sub>2</sub>O Stocksolution AE HTE

Category: HTE

Status: Done

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## Reaction scheme/sample structure



[Ru(bpy)<sub>3</sub>]Cl<sub>2</sub> \* 6H<sub>2</sub>O  
Chemical Formula: C<sub>30</sub>H<sub>36</sub>Cl<sub>2</sub>N<sub>6</sub>O<sub>6</sub>Ru  
Molecular Weight: 748,62400

Chemical Formula: CHNaO<sub>3</sub>  
Molecular Weight: 84,00577

Na<sub>2</sub>S<sub>2</sub>O<sub>8</sub>  
Chemical Formula: Na<sub>2</sub>O<sub>8</sub>S<sub>2</sub>  
Molecular Weight: 238,09154

NaHCO<sub>3</sub>

Na<sub>2</sub>CO<sub>3</sub>  
Chemical Formula: CNa<sub>2</sub>O<sub>3</sub>  
Molecular Weight: 105,98754

H<sub>2</sub>O  
water  
Chemical Formula: H<sub>2</sub>O  
Molecular Weight: 18,01500

## Literature/reference experiments

Literature	<a href="https://doi.org/10.1021/acscatal.6b02595">https://doi.org/10.1021/acscatal.6b02595</a>
Reproduction	/
Related experiment	<a href="#">HTE - AE-383: Preparation of stock solutions for the irradiation of [Ru(bpy)<sub>3</sub>]Cl<sub>2</sub> * 6 H<sub>2</sub>O</a>

## Reagents

Name	CAS Number / Experiment Number	Amount [mmol]	Equivalents	Mass <sub>theo</sub> [mg]	Mass <sub>exp</sub> [mg]	Molar mass [g/mol]	Volume <sub>theo</sub> [ml]	Volume <sub>exp</sub> [ml]	density [g/mL]
Sodiumhydrogen carbonate	<a href="#">144-55-8</a>	13.5	/	1134.1	1134.46	84.006	/	/	/
Sodium carbonate (anhydrous)	<a href="#">497-19-8</a>	12.0	/	1271.9	1271.56	105.988	/	/	/
Sodium persulfate	<a href="#">7775-27-1</a>	0.9	/	214.28	214.21	238.09	/	/	/
[Ru(bpy) <sub>3</sub> ]Cl <sub>2</sub> * 6 H <sub>2</sub> O	<a href="#">50525-27-4</a>	3.0 µmol	/	2.25	2.11	748.62	/	/	/
Milli-Q water	<a href="#">7732-18-5</a>	/	/	/	/	18.015	60	/	1

## Procedure/observations

Date	Time	Step	Observations
12.12	9:45	Each chemical was weighed in a separate 15 mL snap-on cap vial.	
	10:00	To each vial Milli-Q water (Ru: 14.07 mL, Na <sub>2</sub> CO <sub>3</sub> , NaHCO <sub>3</sub> , Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub> : 15 mL) was added using a 2 figure scale.	For NaHCO <sub>3</sub> a 0.9 M suspension was obtained ( <b>AE-395-1</b> ) For Na <sub>2</sub> CO <sub>3</sub> a 0.8 M suspension was obtained ( <b>AE-395-2</b> ) For Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub> a 60 mM solution was obtained ( <b>AE-395-3</b> ) For Ru a 0.2 mM solution was obtained ( <b>AE-395-4</b> )
	10:05	All samples were shortly vortexed to obtain/ensure a homogeneous mixture (Vortex VWR VV3, 4/6 intensity of shaking)	
	13:20	The solutions were transferred into Chem Speed Vials	

## Linked experiments

- AE-265: Preparation of stock solutions for the irradiation of  $[\text{Ru}(\text{bpy})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$
- AE-270: Preparation of stock solutions for the irradiation of  $[\text{Ru}(\text{bpy})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$
- AE-311: Preparation of stock solutions for the irradiation of  $[\text{Ru}(\text{bpy})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$  I
- AE-323: Preparation of stock solutions for the irradiation of  $[\text{Ru}(\text{bpy})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$
- AE-334: Preparation of stock solutions for the irradiation of  $[\text{Ru}(\text{bpy})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$
- AE-342: Preparation of stock solutions for the irradiation of  $[\text{Ru}(\text{bpy})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$  I
- HTE - AE-365: Preparation of stock solutions for the irradiation of  $[\text{Ru}(\text{bpy})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$
- HTE - AE-368: Preparation of stock solutions of  $[\text{Ru}(\text{pby})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$
- HTE - AE-369: Preparation of stock solutions for the irradiation of  $[\text{Ru}(\text{bpy})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$
- HTE - AE-372: Preparation of stock solutions for the irradiation of  $[\text{Ru}(\text{bpy})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$
- HTE - AE-380: Preparation of stock solutions for the irradiation of  $[\text{Ru}(\text{bpy})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$  I
- HTE - AE-383: Preparation of stock solutions for the irradiation of  $[\text{Ru}(\text{bpy})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$
- HTE - AE-395: Preparation of stock solutions for the irradiation of  $[\text{Ru}(\text{bpy})_3]\text{Cl}_2 \cdot 6 \text{H}_2\text{O}$



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Link: <https://elab.water-splitting.org/experiments.php?mode=view&id=1578>