# NB-340: Preparation of RhCl3*3H2O and Cr(NO3)3*9H2O stock solutions

**Date:** 2025-11-11
**Tags:** Stocksolution KRA NB RhCl3*3H2O Cr(NO3)3*9H2O Solution
**Category:** Prep work
**Status:** Done
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## Objective

Preparation of stock solutions of $RhCl_3$ and $Cr(NO_3)_3$ salts.

## Literature/reference experiments

| | |
|---|---|
| **Literature** | https://doi.org/10.1039/D4SC03978E |
| **Reproduction** | / |
| **Similar experiments** | Prep work - EA-373: Preparation of RhCl3 and Cr(NO3)3 stock solutions<br>Prep work - NB-275: Preparation of RhCl3 and Cr(NO3)3 solutions I<br>Prep work - EA-MEJ-357: Preparation of RhCl3 and Cr(NO3)3 stock solutions |

## Reagents

| Name | CAS Number / Experiment Number | Inventory number | Amount [mmol] | Equivalents | $Mass_{theo}$ [mg] | $Mass_{exp}$ [mg] | Molar mass [g/mol] | Density (g/ml) | $Volume_{theo}$ [ml] | $Volume_{exp}$ [ml] | Concentration [mM] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $RhCl_3.3H_2O$, BLD Pharmatech GmbH | 13569-65-8 | C138335 | 0.0189 | / | 5 | 5 | 263.31 | / | / | / | 9.87 |
| milli-Q water for $RhCl_3.3H_2O$ solution | / | / | / | / | / | / | / | / | 1.923 | 1.923 | / |
| $Cr(NO_3)_3.9H_2O$ | 7789-02-8 | / | 0.0509 | / | 20 | 20.38 | 400.15 | / | / | / | 28.81 |
| milli-Q water for $Cr(NO_3)_3.9H_2O$ solution | / | / | / | / | / | / | / | / | 1.767 | 1.767 | / |

### Excel sheet for reagent calculation

NB-340- stock solutions calculations.xlsx

## Glovebox parameters

| | |
|---|---|
| **Glovebox used** | Equipment - Glovebox CEEC I K004 |
| **Date** | 11.11.2025 |
| **Time** | 9:50-10:17 |
| **O2 value before use** | 93.0 ppm |

| | |
|---|---|
| **H2O value before use** | <0.1 ppm |
| **Picture of log book page** | 20251111_101740-glovebox-logbook.jpg |

# Procedure/observations

For transfer of precise liquid amount, Eppendorf pipettes were used (above 100 ul: 1000 ul Eppendorf).

| Date | Time | Step | Observations | Pictures |
|---|---|---|---|---|
| 11.11.2025 | ca. 10:00 | Weighing $RhCl_3.3H_2O$ inside the glovebox Equipment - Glovebox CEEC I K004, transfer it to a 10 ml vial (performed by **KRA**). | Dark red crystals | / |
| | 10:40 | Weighing $Cr(NO_3)_3.9H_2O$ in a 10 ml vial. | Dark blue crystals | / |
| | 10:55 | The calculated amount of water to reach the specific concentration was added to the vial with RhCl3*3H2O crystals. | Orange-red solution **NB-340-RhCl3 solution** | / |
| | 11:00 | The calculated amount of water to reach the specific concentration was added to the vial with $Cr(NO_3)_3.9H_2O$. | Blue solution **NB-340-Cr(NO3)3 solution** | / |
| | ca. 11:05 | Solution of **NB-340-$RhCl_3$** was transferred into a 4ml screw cap vial. | Red solution **NB-340-RhCl3 9.87 mM 11.11.2025** | 20251111_110630-final solutions.jpg |
| | ca. 11:10 | Solution of **NB-340-$Cr(NO_3)_3$** vial was transferred into a 4ml screw cap vial using an Eppendorf pipette. | Blue solution **NB-340-Cr(NO3)3 28.81 mM 11.11.2025** | 20251111_110630-final solutions.jpg |
| | ca. 11:15 | The vials weres covered with Al foil and stored under fume hood. | / | / |

# Product characterization

| Sample | Concentration mM | Mass [mg] | Purity | Volume, mL | Amount [µmol] | Yield [%] | Description | Image | Storage location |
|---|---|---|---|---|---|---|---|---|---|
| **NB-340-$RhCl_3$ 11.11.2025** | 9.87 | / | / | 1.923 | / | / | Red solution | 20251111_110630-final solutions.jpg | Laboratory - Lab E004 - CEEC II, NB fume hood |
| **NB-340-$Cr(NO_3)_3$ 11.11.2025** | 28.81 | / | / | 1.767 | / | / | Blue solution | 20251111_110630-final solutions.jpg | Laboratory - Lab E004 - CEEC II, NB fume hood |

# Results

Fresh stock solution of $RhCl_3$ (9.87 mM in $H_2O$) and $Cr(NO_3)_3$ (28.81 mM in $H_2O$) salts were prepared.

## Linked experiments

Prep work - NB-275: Preparation of RhCl3 and Cr(NO3)3 solutions I

Prep work - EA-373: Preparation of RhCl3 and Cr(NO3)3 stock solutions

## Linked resources

Equipment - Glovebox CEEC I K004

Laboratory - Lab E004 - CEEC II

## Attached files

NB-340- stock solutions calculations.xlsx
sha256: e06e911254ebc01e51438317fe28176cc61c42317ee4eef86d134585f7928e09

20251111_101740-glovebox-logbook.jpg
sha256: 77201e60bd7c95cd87fc4a987af338a985835351ae27d16841e3fe766ad0a2ae

20251111_110630-final solutions.jpg
sha256: 753ff99278bec0877377a9aae8fcfd80c3d9dbf24089d4f14b483be9196b9a7a

Unique eLabID: 20251111-db383ff0fd11deee2542aa280f5ece9849fd7620
Link: https://elab.water-splitting.org/experiments.php?mode=view&id=3412