EA-351: Calcination of SrCO3, 300 C, 1 h, Upscaling (3x)

Date: 2025-10-01
Tags: EA Furnace Muffle Furnace SrTiO3 SrCO3 Calcination Upscaling
Category: SrTiO3
Status: Done
Created by: Ebrahim Abedini

Objective

Calcination of $SrCO_3$ at 300°C, for 1h to make the material ready for $SrTiO_3$ synthesis. 3 times upscaling

Reaction scheme/sample structure

ChemDraw File (linked): EA-351.cdx

Literature/reference experiments

Literature	https://doi.org/10.1039/C9EE00310J
Reproduction	/
Similar experiments	SrTiO3 - NB-265: Calcination of SrCO3, 300 C, 1 h I

Reagents

Name	CAS Number / Experiment Number	Inventory number	Amount [mmol]	Equivalents	$Mass_{theo}$ [g]	$Mass_{exp}$ [g]	Molar mass [g/mol]	Density (g/ml)	Volume [ml]	Concentration [mM]
Strontium Carbonate ($SrCO_3$), TCI	1633-05-2 20250929_1802-SrCO3.jpg	C141117	62.99	/	3 × 3.10 = 9.30	9.31	147.63	3.5	/	/

Furnace Parameters

Equipment - Muffelofen L3/11/P320, Nabertherm GmbH, Lab 106, CEEC I, (Matilda)

Protocol - Heat treatment using Muffelofen L3/11/P320, Nabertherm GmbH, Lab 106, CEEC I

Temperature/time parameters

Used zone or charge sensor	Zone
Used delayed start	/
Used automatic/manual/extended holdback	automatic
The temperature band entered for manual/extended holdback (°C)	/
End time [min], relative to start of program	202

Segments

Program 7	**Target Temperature (°C)**	**Duration (h)**	**Rate (°C/h)**	**Temperature band (°C)**	**Description of the segment**	**Observations**
First segment	300	00:22	600	/	Increase	Initial temperature: 86°C
Second segment	300	01:00	/	/	Holding	/
End segment	/	/	/	/	Naural cooling	End temperature (before opening): 136°C

Procedure/observations

Date	**Time**	**Step**	**Observations**	**Pictures**
29.09.2025	18:06	Weighing 9.31g $SrCO_3$ on a weighing bowl,	White clumps	20250929_1806-weighing the sample.jpg
	18:09	Transferring the sample to an agate mortar	White clumps	20250929_1809-sample before mortaring.jpg
	18:11	The sample was mortared for 2 min.	Broken white clumps, more fine	20250929_1811-sample after mortaring.jpg
	18:13	The mortared sample was transferred into a porcelain crucible ()	/	20250929_1813-the mortared sample before calcination.jpg

	18:21	The crucible with lid was transferred into the furnace Equipment - Muffelofen L3/11/P320, Nabertherm GmbH, Lab 106, CEEC I, (Matilda). The program was designed according to Protocol - Heat treatment using Muffelofen L3/11/P320, Nabertherm GmbH, Lab 106, CEEC I and saved on P=7.	/	20250929_1821-the crucible inside the furnace.jpg
	18:23	Start of the heating program (EA-351-P=7).	Initial temperature: 86°C	20250929_1823-start of the program.jpg
	21:45	End of the heating program.	End temperature (before opening): 136°C	20250929_2145-End of the program.jpg
	21:49	The crucible was removed from the furnace.	White powder, more puffy	20250929_2149-the sample after calcination.jpg
	21:53	The calcined $SrCO_3$ was weighed on a weighing bowl after the calcination.	White powder	20250929_2153-weighing the calcined SrCO3.jpg
	21:58	The weighed sample was transferred into a 10ml snap-cap vial and covered with Al foil. Named: **EA-351-Calcined $SrCO_3$**	White powder **EA-351-Calcined $SrCO_3$**	20250929_2158-EA-351-Calcined SrCO3.jpg
		Note: While weighing the sample, the amount for the next step was collected and used for synthesis of $SrTiO_3$	/	/

Product characterization

Sample	Mass [g]	Purity	$Mass_{pure}$[g]	Amount [µmol]	Yield [%]	Description	Image	Storage location
EA-351-Calcined $SrCO_3$	9.24	/	/	/	99.24	White powder	20250929_2158-EA-351-Calcined SrCO3.jpg	Equipment - Safety storage cabinet - CEEC II Lab E004, shelve A, Ebi container

Results

Calcination of the $SrCO_3$ was performed at 300°C, for 1h. The yield was 99.24%.

Linked experiment

SrTiO3 - NB-265: Calcination of SrCO3, 300 C, 1 h I

Linked resources

Equipment - Muffelofen L3/11/P320, Nabertherm GmbH, Lab 106, CEEC I, (Matilda)

Equipment - Advanced irradiation chamber V1.0 I

Equipment - Advanced power measurment chamber V1.0 I

Equipment - Safety storage cabinet - CEEC II Lab E004

Protocol - Heat treatment using Muffelofen L3/11/P320, Nabertherm GmbH, Lab 106, CEEC I

Attached files

EA-351.cdx
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EA-351.png
sha256: 88b2d3cb60c6970bcb37a1ff25659fc0d8669153c01a9c73fca79a9e4a5f13a9

20250929_2158-EA-351-Calcined SrCO3.jpg
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20250929_2145-End of the program.jpg
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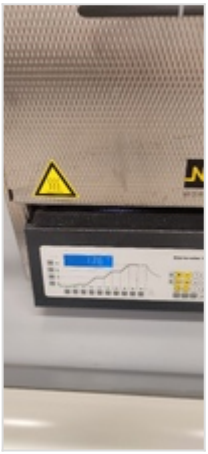

20250929_2149-the sample after calcination.jpg
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20250929_2153-weighing the calcined SrCO3.jpg
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20250929_1823-start of the program.jpg
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20250929_1821-the crucible inside the furnace.jpg

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20250929_1809-sample before mortaring.jpg
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20250929_1811-sample after mortaring.jpg
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20250929_1813-the mortared sample before calcination.jpg
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20250929_1802-SrCO3.jpg
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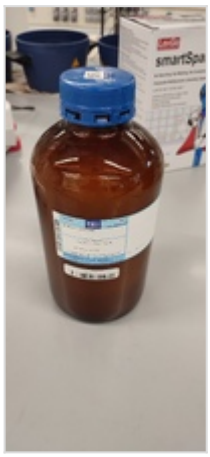

20250929_1806-weighing the sample.jpg
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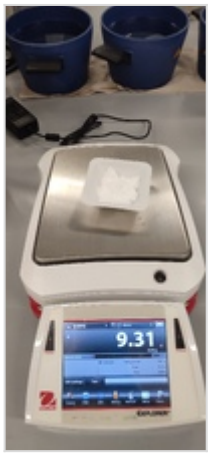

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Link: https://elab.water-splitting.org/experiments.php?mode=view&id=3075