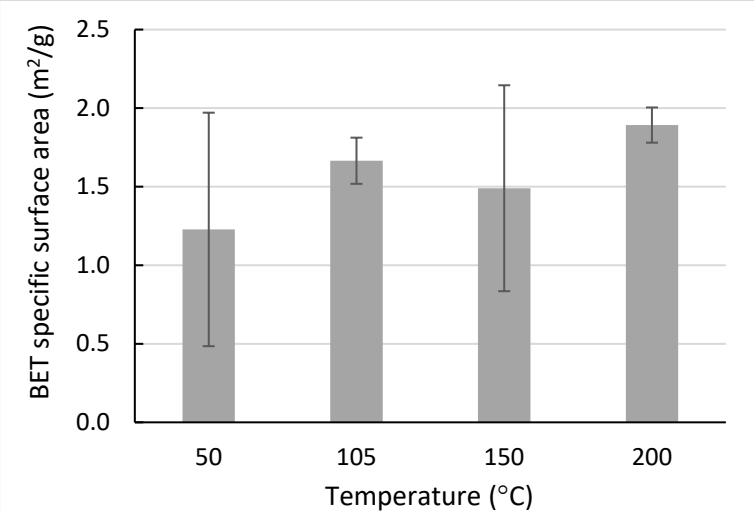
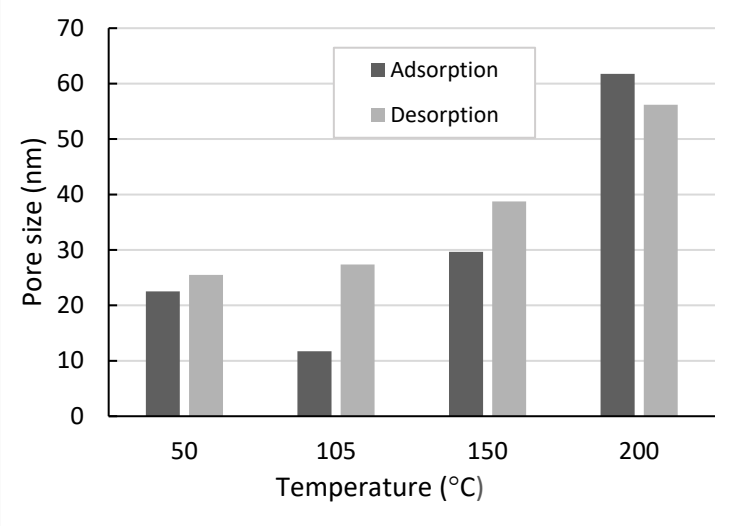
General information	
Type of data	Specific surface area and porosity
Place of experimentation	Pollution Research Group, University of KwaZulu-Natal (South Africa)
Dates of the experiments	2018-2019
Feedstock	
Type of faecal material	Faecal sludge from anaerobic baffled reactor (ABR) from a decentralised wastewater treatment plant (DEWAT)
Location of collection	Durban, South Africa
Age before collection	Unknown
Moisture content	~ 90%wt
Total solids content	~ 10%wt
Volatile solids content	~ 75%db
Ash content	~ 25%db
Presence of trash?	Yes (mainly small pieces of paper after pre-screening during pit emptying)
Pre-treatment	Screening to remove trash
Experimental Procedure	
Drying experimental setup	Oven
Drying time	Until complete drying
Operating conditions	Temperature: 50, 100, 150 and 200°C
Sample form in the dryer	250 g of sample on an aluminium tray (52 × 8.4 × 33 cm)
Analysed parameters	BET specific surface area and pore size
Employed method	Use of BET analyser *Tristar II Series*
Publications	
-	

Data source files
https://www.dropbox.com/s/qo53unswsdmvjgp/2018-2019%20ABR%2C%20UDDT%20and%20VIP%20tests_PRG.xlsx?dl=0
Additional Notes
-
Description of Data

Surface area as a function of temperature



Pore size as a function of temperature



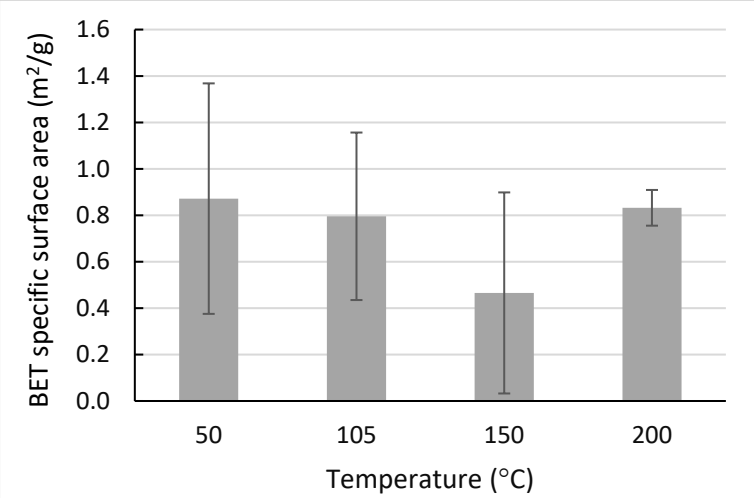
Observations:

- No effect of temperature on the specific surface
- Apparent increase of the pore size by increasing the drying temperature

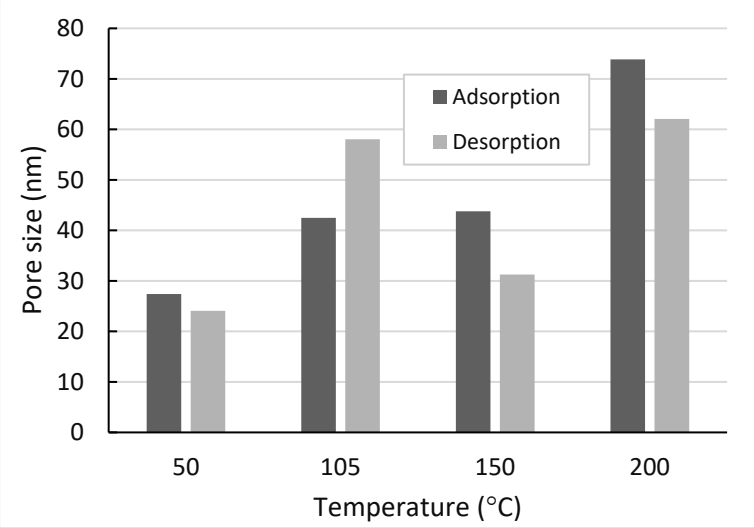
General information	
Type of data	Specific surface area and porosity
Place of experimentation	Pollution Research Group, University of KwaZulu-Natal (South Africa)
Dates of the experiments	2018-2019
Feedstock	
Type of faecal material	Faecal sludge from urine diversion dry toilets (UDDT)
Location of collection	Durban, South Africa
Age before collection	Up to 3 years
Moisture content	~ 75%wt
Total solids content	~ 25%wt
Volatile solids content	~ 55%db
Ash content	~ 45%db
Presence of trash?	Yes (mainly stones and textiles)
Pre-treatment	Screening to remove the large pieces of trash
Experimental Procedure	
Drying experimental setup	Oven
Drying time	Until complete drying
Operating conditions	Temperature: 50, 100, 150 and 200°C
Sample form in the dryer	250 g of sample on an aluminium tray (52 × 8.4 × 33 cm)
Analysed parameters	BET specific surface area and pore size
Employed method	Use of BET analyser Tristar II Series
Publications	
-	

Data source files
https://www.dropbox.com/s/qo53unswsdmvjgp/2018-2019%20ABR%2C%20UDDT%20and%20VIP%20tests_PRG.xlsx?dl=0
Additional Notes
-
Description of Data

Surface area as a function of temperature



Pore size as a function of temperature



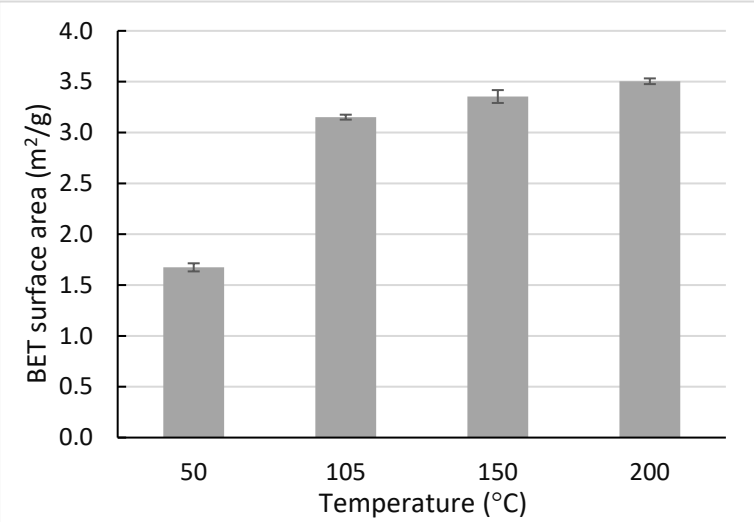
Observations:

- No effect of temperature on the specific surface, and pore size below 200°C
- Apparent higher pore size at 200°C

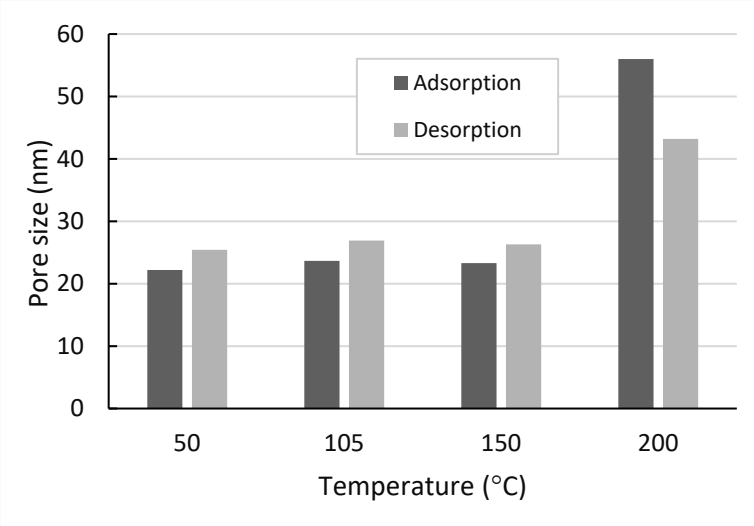
General information	
Type of data	Specific surface area and porosity
Place of experimentation	Pollution Research Group, University of KwaZulu-Natal (South Africa)
Dates of the experiments	2018-2019
Feedstock	
Type of faecal material	Faecal sludge from ventilated improved pit latrines (VIP)
Location of collection	Durban, South Africa
Age before collection	Up to 3 years
Moisture content	~ 75%wt
Total solids content	~ 25%wt
Volatile solids content	~ 40%db
Ash content	~ 60%db
Presence of trash?	Yes (mainly hair and stones)
Pre-treatment	Screening to remove trash
Experimental Procedure	
Drying experimental setup	Oven
Drying time	Until complete drying
Operating conditions	Temperature: 50, 100, 150 and 200°C
Sample form in the dryer	250 g of sample on an aluminium tray (52 × 8.4 × 33 cm)
Analysed parameters	BET specific surface area and pore size
Employed method	Use of BET analyser *Tristar II Series*
Publications	
-	

Data source files
https://www.dropbox.com/s/qo53unswsdmvjgp/2018-2019%20ABR%2C%20UDDT%20and%20VIP%20tests_PRG.xlsx?dl=0
Additional Notes
-
Description of Data

Surface area as a function of temperature



Pore size as a function of temperature



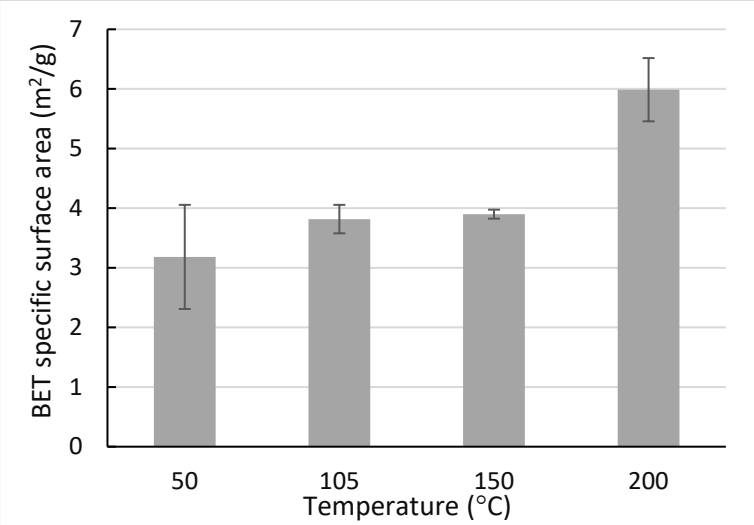
Observations:

- No effect of temperature on the specific surface above 50°C and pore size below 200°C
- Lower specific area at 50°C
- Higher pore size at 200°C

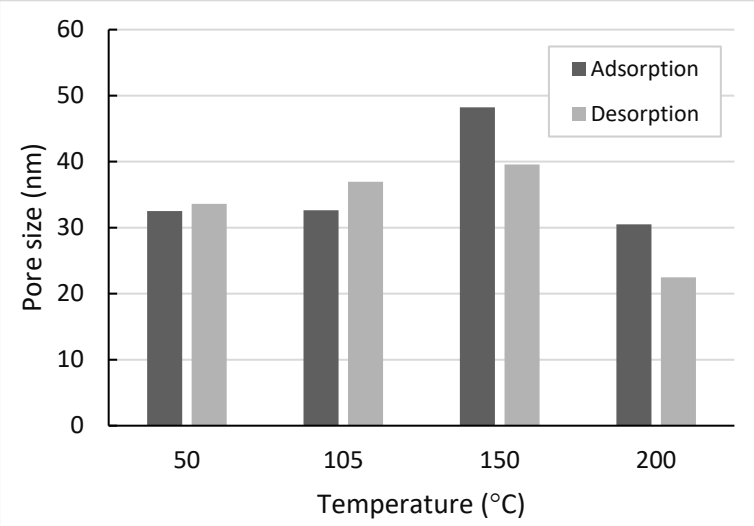
General information	
Type of data	Specific surface area and porosity
Place of experimentation	Pollution Research Group, University of KwaZulu-Natal (South Africa)
Dates of the experiments	2018-2019
Feedstock	
Type of faecal material	Faecal sludge from ventilated improved pit latrines (VIP)
Location of collection	Durban, South Africa
Age before collection	Up to 5 years
Moisture content	~ 95%wt
Total solids content	~ 5%wt
Volatile solids content	~ 65%db
Ash content	~ 35%db
Presence of trash?	No (sludge pre-screened during pit emptying)
Pre-treatment	Mixing
Experimental Procedure	
Drying experimental setup	Oven
Drying time	Until complete drying
Operating conditions	Temperature: 50, 100, 150 and 200°C
Sample form in the dryer	250 g of sample on an aluminium tray (52 × 8.4 × 33 cm)
Analysed parameters	BET specific surface area and pore size
Employed method	Use of BET analyser *Tristar II Series*
Publications	
-	

Data source files
https://www.dropbox.com/s/qo53unswsdmvjgp/2018-2019%20ABR%2C%20UDDT%20and%20VIP%20tests_PRG.xlsx?dl=0
Additional Notes
-
Description of Data

Surface area as a function of temperature



Pore size as a function of temperature



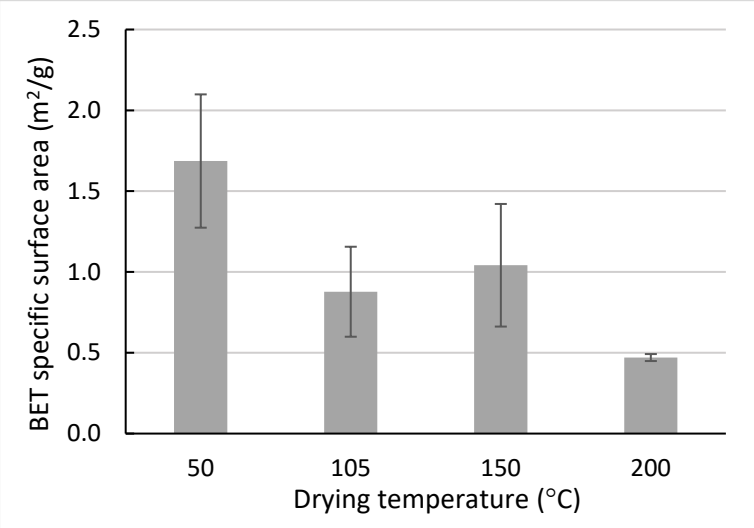
Observations:

- No effect of temperature on the specific surface below 200°C, and pore size at 50, 100 and 200°C
- Higher specific area at 200°C
- Higher pore size at 150°C

General information	
Type of data	Specific surface area and porosity
Place of experimentation	Pollution Research Group, University of KwaZulu-Natal (South Africa)
Dates of the experiments	2019
Feedstock	
Type of faecal material	Fresh faeces
Location of collection	Durban, South Africa
Age before collection	A few days
Moisture content	~ 80%wt
Total solids content	~ 20%wt
Volatile solids content	~ 85%db
Ash content	~ 15%db
Presence of trash?	No
Pre-treatment	Mixing
Experimental Procedure	
Drying experimental setup	Oven
Drying time	Until complete drying
Operating conditions	Temperature: 50, 100, 150 and 200°C
Sample form in the dryer	250 g of sample on an aluminium tray (52 × 8.4 × 33 cm)
Analysed parameters	BET specific surface area and pore size
Employed method	Use of BET analyser *Tristar II Series*
Publications	
-	

Data source files
https://www.dropbox.com/s/vpa68hptk81v4e4/2019%20Fresh%20faeces%20tests_PRG.xlsx?dl=0
Additional Notes
Fresh faeces collected from voluntary and anonymous donations
Description of Data

Surface area as a function of temperature



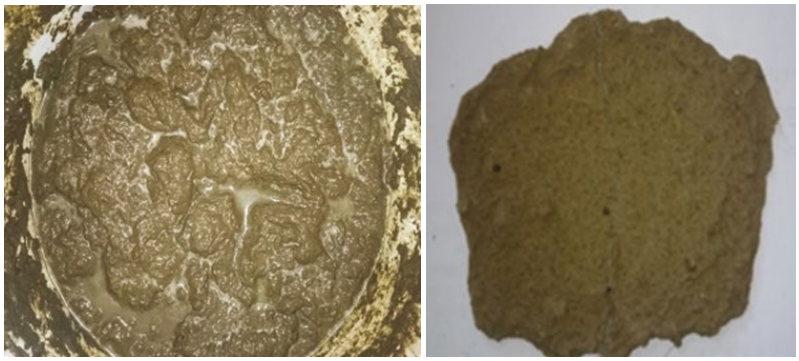
Observations:

- Same specific surface area for samples dried at 50, 105 and 150°C
- Lower specific surface area for sample dried at 200°C

General information	
Type of data	Visual aspects
Place of experimentation	Pollution Research Group, University of KwaZulu-Natal (South Africa)
Dates of the experiments	2014 - 2015
Feedstock	
Type of faecal material	Faecal sludge from ventilated improved pit latrine (VIP)
Location of collection	Durban, South Africa
Age before collection	Up to 5 years
Moisture content	~ 80%wt
Total solids content	~ 20%wt
Volatile solids content	~ 50%db
Ash content	~ 50%db
Presence of trash?	Yes
Pre-treatment	Screening to remove the large pieces of trash
Experimental Procedure	
Drying experimental setup	Custom-design convective drying rig
Drying time	Batch until complete drying
Operating conditions	○ Air temperature: 40, 60 and 80°C ○ Air humidity: 0, 15 and 25% ○ Air velocity: 0.03, 0.06 and 0.12 cm/s
Sample form in the dryer	Pellets of 8, 10, 12 and 14 mm diameter
Analysed parameters	Visual aspect
Employed method	Photograph
Publications	
Makununika, B. S. N. (2016). Thermal drying of faecal sludge from VIP latrines and characterisation of dried faecal material. Master thesis. University of KwaZulu-Natal, Durban, South Africa.	

Data source files	
-	
Additional Notes	
-	
Description of Data	
Aspect of pellets before (left) and after (right) drying 	Observations ○ After drying: crust and crack formation; shrinkage; loss of shiny surface; change of color (less dark)

General information	
Type of data	Visual aspects
Place of experimentation	Pollution Research Group, University of KwaZulu-Natal (South Africa)
Dates of the experiments	2014 - 2015
Feedstock	
Type of faecal material	Faecal sludge from ventilated improved pit latrine (VIP)
Location of collection	Durban, South Africa
Age before collection	Up to 5 years
Moisture content	~ 80%wt
Total solids content	~ 20%wt
Volatile solids content	~ 50%db
Ash content	~ 50%db
Presence of trash?	Yes
Pre-treatment	Screening to remove the large pieces of trash
Experimental Procedure	
Drying experimental setup	Custom-design convective drying rig
Drying time	Batch until complete drying
Operating conditions	○ Air temperature: 40, 60 and 80°C ○ Air humidity: 0, 15 and 25% ○ Air velocity: 0.03, 0.06 and 0.12 cm/s
Sample form in the dryer	Thin layer on a petri dish of 70 mm diameter and 4 mm height
Analysed parameters	Visual aspect
Employed method	Photograph
Publications	
Makununika, B. S. N. (2016). Thermal drying of faecal sludge from VIP latrines and characterisation of dried faecal material. Master thesis. University of KwaZulu-Natal, Durban, South Africa.	

Data source files	
-	
Additional Notes	
-	
Description of Data	
Aspect of the faecal sludge before (left) and after (right) drying 	Observations ○ After drying: crust and crack formation; shrinkage; loss of shiny surface; change of color (less dark)

General information	
Type of data	Visual aspects
Place of experimentation	Pollution Research Group, University of KwaZulu-Natal (South Africa)
Dates of the experiments	2017 - 2018
Feedstock	
Type of faecal material	Faecal sludge from ventilated improved pit latrine (VIP)
Location of collection	Durban, South Africa
Age before collection	Up to 5 years
Moisture content	~ 80%wt
Total solids content	~ 20%wt
Volatile solids content	~ 50%db
Ash content	~ 50%db
Presence of trash?	Yes
Pre-treatment	Screening to remove the large pieces of trash
Experimental Procedure	
Drying experimental setup	Custom-design solar thermal drying rig
Drying time	3 to 5 hours
Operating conditions	○ Irradiance: from 800 to 1000 W/m^2 (sunny conditions) ○ Air flowrate: 0.5 m^3/min (corresponding to an air velocity of 0.5 m/s) ○ Air temperature: ambient (~20°C) ○ Air humidity: ~10%
Sample form in the dryer	Thin layer of 5 and 10 mm thickness, and 60 mm diameter
Analysed parameters	Visual aspect
Employed method	Photograph
Publications	
Mugauri, T.R. (2019). *Drying of faecal sludge from ventilated improved pit latrines (VIP latrines) using solar thermal energy*. MSc thesis, University of KwaZulu-Natal, South Africa.	

Septien, S., Mugauri, T.R., Singh, A., Inambao, F. (2018). *Solar drying of faecal sludge from on-site sanitation facilities*. 5th Southern Africa Solar Thermal Energy Conference, Durban, South Africa, 25-27 June.

Septien, S., Mugauri, T.R., Singh, A., Inambao, F. (2017). *Drying of Faecal Sludge using Solar Thermal Energy* (final report project K5/2582). Water Research Commission, South Africa.

Data source files

-

Additional Notes

-

Description of Data

Aspect of sludge before (a) and after (b) drying

A **B**

Observations

- After drying: crust and crack formation; shrinkage; loss of shiny surface

General information	
Type of data	Visual aspects
Place of experimentation	Pollution Research Group, University of KwaZulu-Natal (South Africa)
Dates of the experiments	2019-2020
Feedstock	
Type of faecal material	Faecal sludge from ventilated improved pit latrine (VIP)
Location of collection	Durban, South Africa
Age before collection	Up to 5 years
Moisture content	~ 75%wt
Total solids content	~ 25%wt
Volatile solids content	Not measured
Ash content	Not measured
Presence of trash?	Small amounts of trash
Pre-treatment	Trash removal
Experimental Procedure	
Drying experimental setup	Custom-design solar thermal drying rig
Drying time	5 hours
Operating conditions	○ Irradiance: 800 – 1300 W/m^2 (sunny conditions) ○ Air flowrate: 0.5 m^3/min (corresponding to an air velocity of 0.5 m/s) ○ Air temperature: ambient (~20°C), 40 and 80°C ○ Air humidity: ~10%
Sample form	Thin layer of 5 mm thickness and 110 mm diameter
Analysed parameters	Visual aspect
Employed method	Photograph
Publications	
-	

Data source files	
-	
Additional Notes	
-	
Description of Data	
Aspect of sludge before (left) and after (right) drying at ambient conditions, 40 and 80°C **A** **B**  **C** **D** 	Observations: ○ After drying: crust and crack formation; shrinkage; loss of shiny surface ○ Greater cracking and shrinkage at higher temperature

General information	
Type of data	Shrinkage
Place of experimentation	Pollution Research Group, University of KwaZulu-Natal (South Africa)
Dates of the experiments	2017 - 2018
Feedstock	
Type of faecal material	Faecal sludge from ventilated improved pit latrine (VIP)
Location of collection	Durban, South Africa
Age before collection	Up to 5 years
Moisture content	~ 80%wt
Total solids content	~ 20%wt
Volatile solids content	~ 50%db
Ash content	~ 50%db
Presence of trash?	Yes
Pre-treatment	Screening to remove the large pieces of trash
Experimental Procedure	
Drying experimental setup	Custom-design solar thermal drying rig
Drying time	3 to 5 hours
Operating conditions	○ Irradiance: from 75 to 1000 W/m^2 (from overcast to sunny conditions) ○ Air flowrate: 0.5 m^3/min (corresponding to an air velocity of 0.5 m/s) ○ Air temperature: ambient (~20°C) ○ Air humidity: ~10%
Sample form in the dryer	Thin layer of 5 and 10 mm thickness, and 60 mm diameter
Analysed parameters	(1) Reduction of volume after drying (2) Moisture content
Employed method	(1) Measurement of the dimensions of the sample before and after drying (SOP 8.8.2.1) (2) Weighing the sample before and after oven drying at 105°C for 24 h (SOP 8.7.1.1)

Publications

Mugauri, T.R. (2019). *Drying of faecal sludge from ventilated improved pit latrines (VIP latrines) using solar thermal energy*. MSc thesis, University of KwaZulu-Natal, South Africa.

Septien, S., Mugauri, T.R., Singh, A., Inambao, F. (2018). *Solar drying of faecal sludge from on-site sanitation facilities*. 5th Southern Africa Solar Thermal Energy Conference, Durban, South Africa, 25-27 June.

Septien, S., Mugauri, T.R., Singh, A., Inambao, F. (2017). *Drying of Faecal Sludge using Solar Thermal Energy* (final report project K5/2582). Water Research Commission, South Africa.

Data source files

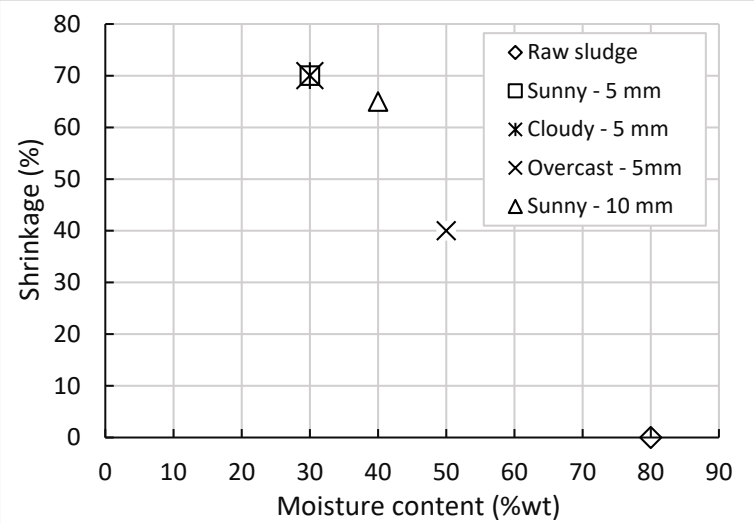
https://www.dropbox.com/s/ssumqzociucjaj2/Shrinkage%20of%20VIP%20sludge%20%282017-2018%29.xlsx?dl=0

Additional Notes

-

Description of Data

Shrinkage versus the moisture content obtained after drying at the different conditions



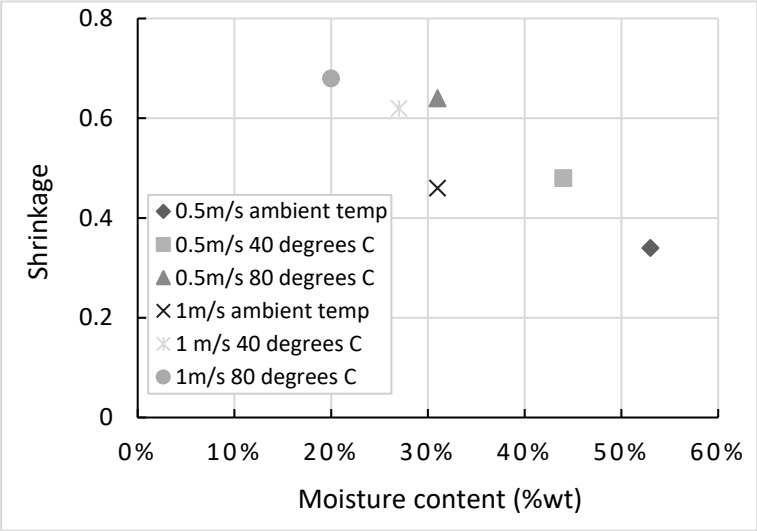
Observations

- More shrinkage as sample dried at lower moisture content

General information	
Type of data	Shrinkage
Place of experimentation	Pollution Research Group, University of KwaZulu-Natal (South Africa)
Dates of the experiments	2019 - 2020
Feedstock	
Type of faecal material	Faecal sludge from ventilated improved pit latrine (VIP)
Location of collection	Durban, South Africa
Age before collection	Up to 5 years
Moisture content	~ 75%wt
Total solids content	~ 25%wt
Volatile solids content	Not measured
Ash content	Not measured
Presence of trash?	Small amounts of trash
Pre-treatment	Screening for trash removal
Experimental Procedure	
Drying experimental setup	Custom-design solar thermal drying rig
Drying time	5 hours
Operating conditions	○ Irradiance: 800 – 1300 W/m^2 (sunny conditions) ○ Air flowrate: 0.5 and 1 m^3/min (corresponding to an air velocity of 0.5 m/s) ○ Air temperature: ambient (~20°C), 40 and 80°C ○ Air humidity: ~10%
Sample form	Thin layer of 5 mm thickness and 110 mm diameter
Analysed parameters	Reduction of volume after drying
Employed method	Measurement of the dimensions of the sample before and after drying (SOP 8.8.2.1)
Publications	
-	

Data source files
https://www.dropbox.com/s/gscuvzvus55zfsr/2019-2020%20VIP%20Shrinkage%20data.xlsx?dl=0
Additional Notes
○ Density measured on the sample obtained at the end of a few experiments ○ Low precision of the current method (rough estimation)
Description of Data

Shrinkage versus the moisture content at the end of a few experiments



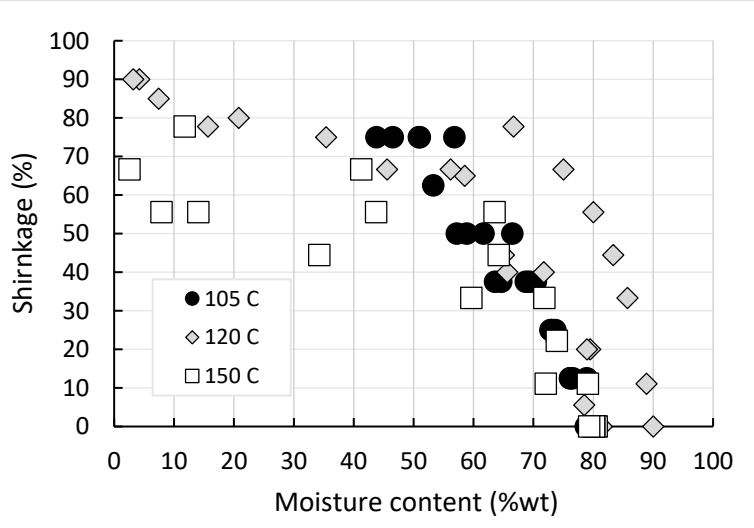
Observations:

- Higher shrinkage as sludge dried

General information	
Type of data	Shrinkage
Place of experimentation	Duke University Center for WaSH-AID, Durham, NC
Dates of the experiments	2016-2017
Feedstock	
Type of faecal material	Fresh faeces
Location of collection	Durban, South Africa
Age before collection	A few days
Moisture content	~ 80%wt
Total solids content	~ 20%wt
Volatile solids content	Not measured
Ash content	Not measured
Presence of trash?	No
Pre-treatment	None
Experimental Procedure	
Drying experimental setup	Convection toaster oven
Drying time	Until stabilisation of the sample mass
Operating conditions	○ Air temperature: 105, 120 and 150°C ○ Relative humidity: ambient ○ Air velocity: none
Sample form in the dryer	9 mm thick sample in a 100 m diameter petri dish
Analysed parameters	Thickness
Employed method	Callipers to measure the thickness at each time point (diameter assumed unchanged) (SOP 8.7.1.1)

Publications
-
Data source files
https://www.dropbox.com/s/tgg4sehv3xjlfhq/RTI%20International%20data_fresh%20faeces%20convective%20drying%20kinetics%20and%20shrinkage%20%282016-2017%29.xlsx?dl=0
Additional Notes
○ Fresh faeces collected from voluntary and anonymous donations
Description of Data

Shrinkage during drying at different temperatures



Observations

- Shrinkage of the sample until reaching 40-60%wt moisture content
- Slightly lower shrinkage during drying at 150°C compared to lower temperatures
- Diameter visually unchanged throughout experiments.