



KRDC
Kerone Research &
Development Center



48⁺ Year
Of experience

Continuous Infra-Red Heat Treatment for Drying of Sodium bisulfite(wet)



In Association with SVCH-Technologii, Moscow (Russia)
ISO 9001:2015 | ISO 14001:2015 | EMS 14001 | OHSAS 18001:2007

Customer:	
Process:	Continuous Infra-Red Heat Treatment for drying of Sodium Bisulfite

Test Report No: 251/KRDC/LAB/17 Mum 29/12/2024

Date Sample reception : 04/3/2024
ID : 182/LAB/24

Sample Description:

Sampling : As Requested
Sample Condition : Acceptable
Sampling Date : 04/03/2024
Product : Sodium Bisulfite (Wet)
End Date Test : 04/03/2024

Laboratory Experimental System –



Format: F/R&D/01

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Address

Kerone Research & Development Center (KRDC) Plot No K2, Industrial Gala F4A, D-Wing, MGN Properties, Opposite Godrej Co., Addl MIDC Anand Nagar, Ambarnath (E)- 421506 (India) +91-2512620543/44

Specifications –

IR Power	5 kW
Type of IR Emitters	Quartz Infrared
Rotary Drum Size	Φ324 mm x 800 mm long x 3mm Thick.
Thermal Monitoring System	Single Channel Fiber Optic: Range -40 to 250°C
Exhaust	Exhaust port with manual damper
Air Circulation Fan	Radial Fan FHP 0.5HP

Laboratory's Environmental Conditions –

Temperature (degree C)	29.4°C (±5°C)
Humidity (%)	≤50% RH
Pressure (kN/m² or kPa)	Not recorded

Note for recommendation: Environmental conditions have a direct impact on test results. Accuracy and consistency of test data are affected by the laboratory conditions.





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Laboratory's Environmental Conditions –

Name of Equipment	Picture of Equipment	Specification
Compact Thermal Imaging Camera		Model: FLIR E-30 Resolutions: 160x120IR Thermal Sensitivity of 0.10°C
Thermo Hygrometer		Model No: HTC-2 Temperature accuracy: $\pm 0.1^\circ\text{C}$ (1.80°F) Temperature resolution: 0.1°C (0.2°F) Humidity range: 10%~99% RH Humidity accuracy: $\pm 5\%$ RH Humidity resolution: 1% RH
Moisture Analyzer		Make: Axis Balance Description: Moisture Range: 1% (sample 0.5/5g), 0.01% (Sample > 5g)
Analytical Balances LINB-A10		Capacity: 100g Minimum Weighing: 0.0004g Resolution: 0.0001g Pan size: $\varnothing 80$ mm

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Procedure of the Experiment –

- The experiment was performed on Sodium Bisulfite to speed up the heating rate.
- For this experimental run, the gives sample was taken and passed in the continuous IR heating system with suitable parameters.
- After the heating treatment, the sample was analyzed.

Analytical Results:

Trial 01

Initial weight: 5Kgs

Initial Moisture: 23.7%

Cycle	RPM	Set Temp	On Product Temp	Cycle time (Travelling time)	Total Output Time	Final weight	Final Moisture	Remark
After 01	0.15	250 °C	115 °C	36 min	50 min	3.786 kg	16.9 %	Dried as desired
After 02	0.15	250 °C	120 °C	36 min	50 min	3.01 kg	8.6 %	Dried as desired
After 03	0.15	250 °C	118 °C	36 min	50 min	2.520 kg	1.1 %	Dried as desired

Time of one Drum Rotation: 06 min 36sec

Trial 02

Initial weight: 5Kgs

Initial Moisture: 25%

Cycle	RPM	Set Temp	On Product Temp	Cycle time (Travelling time)	Total Output Time	Final weight	Final Moisture	Remark
After 01	0.15	250 °C	125 °C	36 min	50 min	3.4kg	15.2 %	Dried as desired
After 02	0.15	250 °C	120 °C	36 min	50 min	2.9 kg	7.6 %	Dried as desired
After 03	0.15	250 °C	116 °C	36 min	50 min	2.3 kg	1.0%	Dried as desired

Time of one Drum Rotation: 06 min 36sec

Format: F/R&D/01

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Images During Trials:

Initial Image

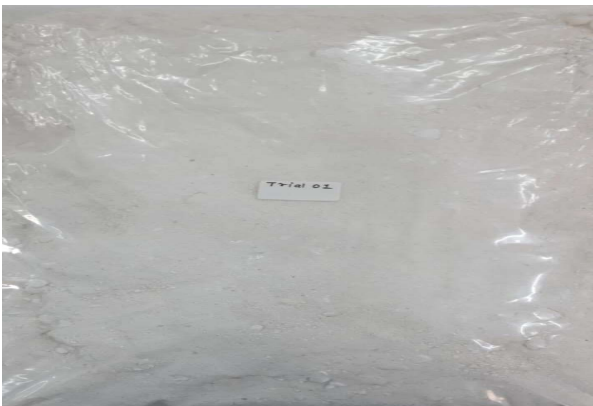


Trial 01

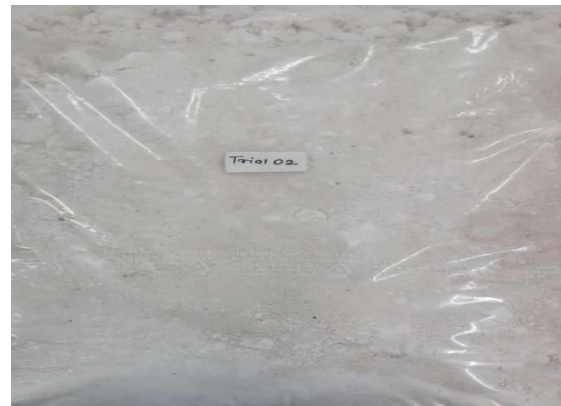


Trial 02

Final Image:



Trial 01



Trial 02

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Moisture Analysis Report:

Trial01

Trial-01	Trial-02
<p style="text-align: center;">Drying started</p> <hr/> <p>Date : 4-03-2024 Time :12:35:04 Model:AGS200 Serial number : 138</p> <p style="text-align: center;">Drying parameters</p> <hr/> <p>Product : 0 Drying temperature : 140.0 °C Drying profile : standard Mode : Short mode Calculation : $\frac{(m0-m)}{m0} \times 100\%$ Finished : 3 samples</p> <p>Initial weight : 1.660 g Final weight : 1.267 g Drying time : 00:40:40s Sampling interval : 20 sec Moisture : 23.7 %</p> <p>NOTE Initial</p> <p>The analysis performed by:</p> <p>Signature: <i>Panay</i></p>	<p style="text-align: center;">Drying started</p> <hr/> <p>Date : 5-03-2024 Time :14:05:14 Model:AGS200 Serial number : 138</p> <p style="text-align: center;">Drying parameters</p> <hr/> <p>Product : 0 Drying temperature : 140.0 °C Drying profile : standard Mode : Short mode Calculation : $\frac{(m0-m)}{m0} \times 100\%$ Finished : 3 samples</p> <p>Initial weight : 0.536 g Final weight : 0.530 g Drying time : 00:01:40s Sampling interval : 20 sec Moisture : 1.1 %</p> <p>NOTE Final</p> <p>The analysis performed by:</p> <p>Signature: <i>Panay</i></p>

Trial 02

Trial-02	Trial-02
<p style="text-align: center;">Drying started</p> <hr/> <p>Date : 5-03-2024 Time :12:01:14 Model:AGS200 Serial number : 138</p> <p style="text-align: center;">Drying parameters</p> <hr/> <p>Product : 0 Drying temperature : 140.0 °C Drying profile : standard Mode : Short mode Calculation : $\frac{(m0-m)}{m0} \times 100\%$ Finished : 3 samples</p> <p>Initial weight : 0.772 g Final weight : 0.574 g Drying time : 00:16:00s Sampling interval : 20 sec Moisture : 25.6 %</p> <p>NOTE Initial</p> <p>The analysis performed by:</p> <p>Signature: <i>Panay</i></p>	<p style="text-align: center;">Drying started</p> <hr/> <p>Date : 5-03-2024 Time :14:07:26 Model:AGS200 Serial number : 138</p> <p style="text-align: center;">Drying parameters</p> <hr/> <p>Product : 0 Drying temperature : 140.0 °C Drying profile : standard Mode : Short mode Calculation : $\frac{(m0-m)}{m0} \times 100\%$ Finished : 3 samples</p> <p>Initial weight : 0.538 g Final weight : 0.532 g Drying time : 00:01:40s Sampling interval : 20 sec Moisture : 1.1 %</p> <p>NOTE Final</p> <p>The analysis performed by:</p> <p>Signature: <i>Panay</i></p>

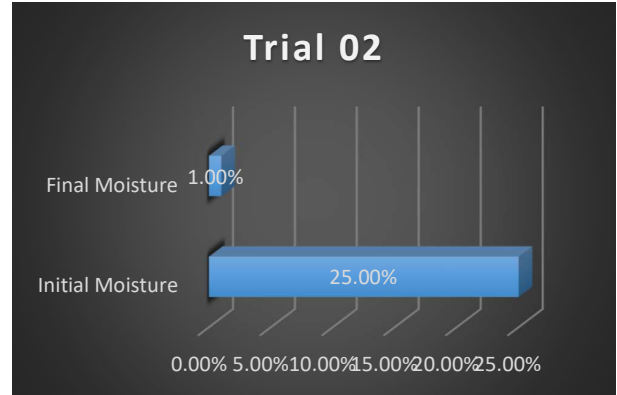
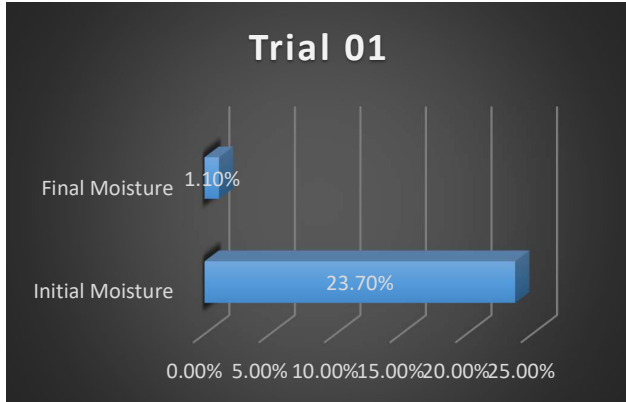
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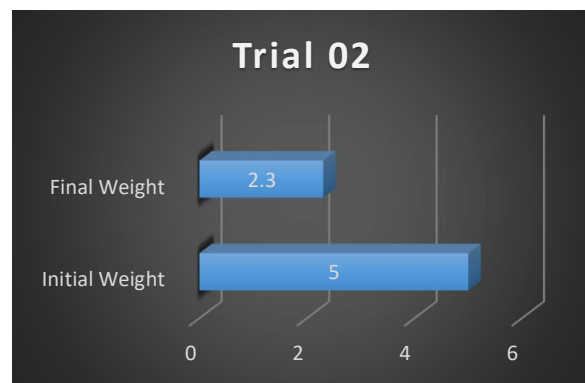
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LOD of Moisture in %:



LOD of Weight in (gm):



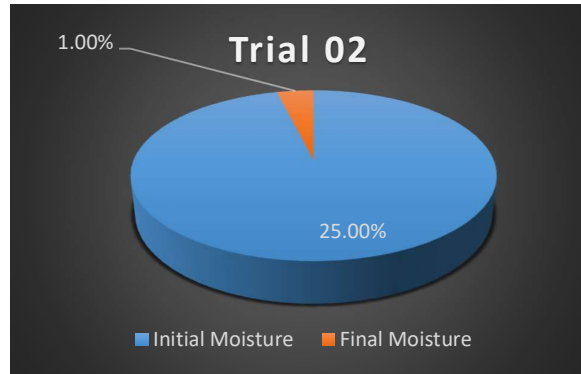
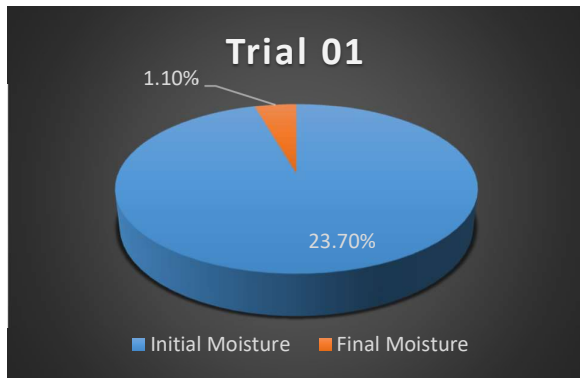
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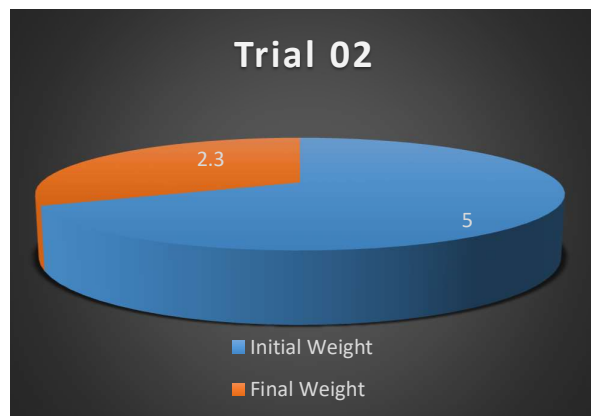
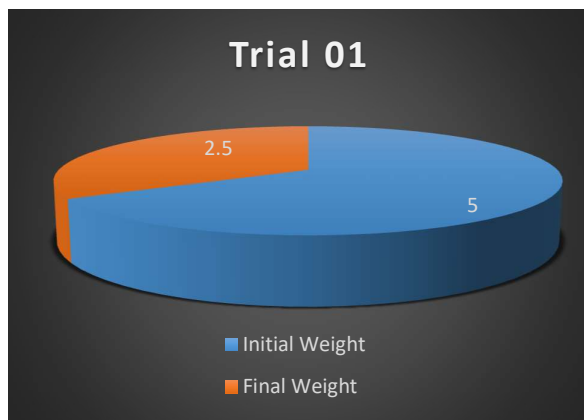
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Pie Chart of Moisture %



Pie Chart of Weight (gm)



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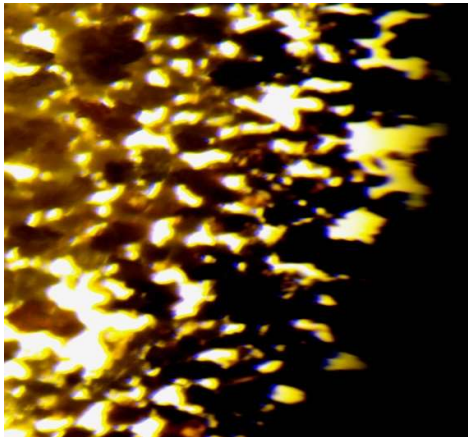
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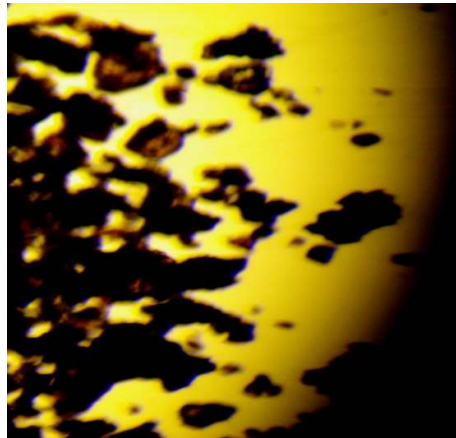


Microscopic Images:

Trial 01 :

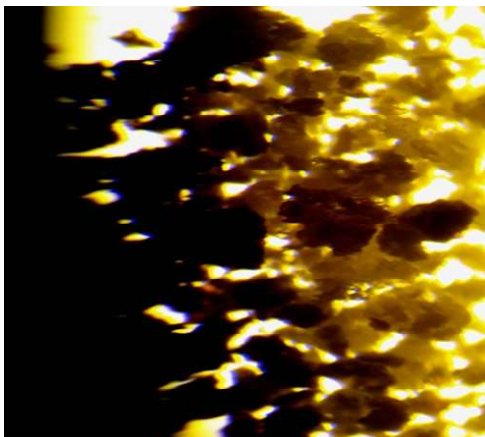


Initial

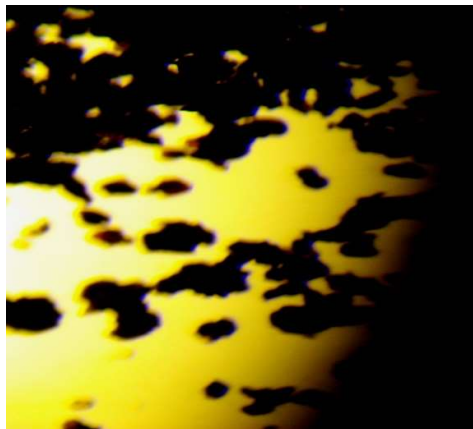


Final

Trial 02 :



Initial



Final

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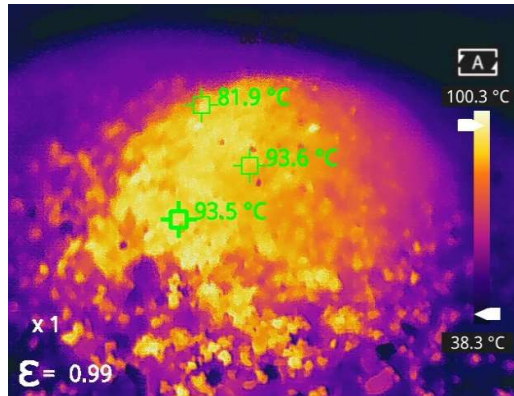
Thermal Images:

Measurements

SP1	43.8°C
SP2	43.0°C
SP3	45.6°C

Parameters

Emissivity	0.99
Temperature	56.2°C

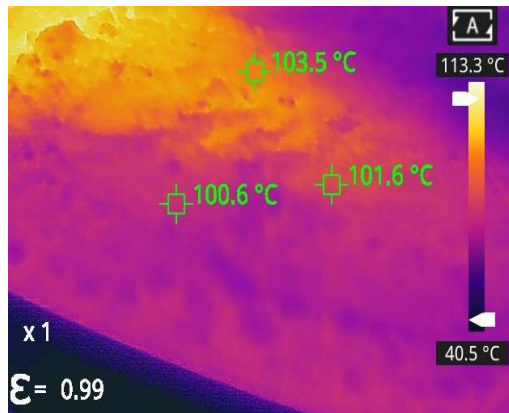


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Observations:

The heating behavior of Sodium Bisulfite was investigated under the Infra-red rotary heating system. The heating rate was found to be increasing with respect to the increase in time. As per the physical investigation it was observed that the product was dried to desired moisture content.

Mr. Pranay Yerunkar
(Tested by)

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