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Corresponds to studies #23 and #24 in Attachment A of transmittal memo on CBI  
HERO ID:4731544

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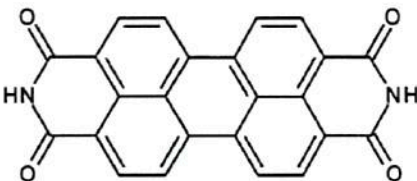
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## Final Report

Physico-chemical properties of "Paliogen Violet 5011"  
Study No. 11L00105 (confidential)

### General Aspects

Test item	"Paliogen Violet 5011"
Chemical identity	Anthra[2,1,9-def:6,5,10-d'e'f]diisoquinoline-1,3,8,10(2H,9H)-tetrone
Chemical structure	
Empirical formula	C <sub>24</sub> H <sub>10</sub> N <sub>2</sub> O <sub>4</sub>
Molar mass	390.35 g/mol
Batch identification	P 100012
Date of production (test item)	November 18, 2010
Purity	≥ 98 – 99 % (given by the provider of the test item, Dr. Garcia)
Origin of test item	██
PSN	11/0223-1
CAS no.	81-33-4
Sponsor	██
Date of receipt of order	March 18, 2011
Date of receipt of test item	March 23, 2011
Testing facility	Competence Center Analytics, BASF SE, D-67056 Ludwigshafen
Author of the final report	██

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## Physico-chemical properties of "Paliogen Violet 5011"

Study No. 11L00105 (confidential)

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Study director	
Storage cond. test item	Room temperature
Test period	April 1 – November 28, 2011
Storage of records	GLP archives, Competence Center Analytics

## Summary of Results

<b>Melting Point</b>	No melting point was found between 20°C and 500°C. The test item is solid at room temperature.
<b>Boiling Point</b>	DSC-measurements show no melting point of the test item below 500°C. Therefore the normal boiling point cannot be determined.
<b>Vapour Pressure</b>	$p_{20^{\circ}\text{C}} < 1 \cdot 10^{-6} \text{ hPa}$ , $p_{25^{\circ}\text{C}} < 1 \cdot 10^{-6} \text{ hPa}$ , $p_{50^{\circ}\text{C}} < 1 \cdot 10^{-6} \text{ hPa}$
<b>Relative Density</b>	$D_4^{20} = 1.584$
<b>Surface Tension</b>	According to OECD Guideline for the Testing of Chemicals 115, the surface tension of the test item need not be determined, because the water solubility is $< 1 \text{ mg/l}$ ( $0.011 \text{ mg/l}$ at $T = 20.0^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ , see section 6).
<b>Water Solubility</b>	The water solubility of the test item is $0.011 \pm 0.005 \text{ mg/l}$ at $20.0^{\circ}\text{C} \pm 0.5^{\circ}\text{C}$ .
<b>Partition Coefficient n-Octanol / Water (<math>P_{ow}</math>)</b>	<p>The <math>P_{ow}</math> of the test item cannot be determined according to the shake flask method (OECD Guideline 107), because of the poor solubility in water and in n-octanol as well.</p> <p>The HPLC method (OECD-Guideline 117) is also not suitable to determine <math>P_{ow}</math>, because the test item cannot be chromatographed under the prescribed conditions.</p> <p><i>Estimation via the single solubilities in n-octanol and in water:</i> <math>\log P_{ow} &lt; 1</math> The n-octanol solubility of the test item at <math>T = 20.0^{\circ}\text{C} \pm 0.5^{\circ}\text{C}</math> is <math>&lt; 0.07 \text{ mg/l}</math>.</p>
<b>Dissociation Constant (<math>pK_a</math>)</b>	Due to its chemical structure the test item is not soluble in water ( $0.011 \text{ mg/l}$ ; see section 6). The determination of the dissociation constant of an aqueous preparation of the test item, according to OECD Guideline for the Testing of Chemicals 112, is not feasible.

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**Particle Size Distribution**

d(0.1):	5.9 µm	D[3,2]:	16.9 µm
d(0.5):	46.9 µm	D[4,3]:	232 µm
d(0.9):	806 µm		

&lt; 100 µm: 64.6 %; &lt; 10 µm: 18.5 % &lt; 4 µm: 5.1 %

**1 Melting Point****Summary**

No melting temperature was found between 20°C and 500°C.  
The test item is solid at room temperature.

**Method**

The determination was carried out in accordance with OECD  
Guideline for the Testing of Chemicals 102.

**Principle**

The melting temperature was measured by Differential  
Scanning Calorimetry.

**Apparatus**

PC controlled DSC instrument (Model DSC 204 Phoenix of  
Netzsch), calibrated with a set of certified standards.  
Aluminium crucibles (Netzsch)  
Balance (Mettler AT 250)

**Measuring parameters**

Sample weight 3.50 mg (Test 1) crucible with pierced lid  
3.40 mg (Test 2) crucible with pierced lid

Temperatures (Test 1):

Temp. [°C]	Mode	Heat.Rate [K/min]	Duration [h:min]
20	Start		
20	isothermal	0.0	0:02
400	dynamic	2.5	2:32
20	dynamic	-20.0	0:19
20	isothermal	0.0	0:02



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**Physico-chemical properties of "Paliogen Violet 5011"**

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**Temperatures (Test 2):**

Temp. [°C]	Mode	Heat.Rate [K/min]	Duration [h:min]
20	Start		
20	isothermal	0.0	0:02
500	dynamic	20.0	0:24
20	dynamic	-20.0	0:24
20	isothermal	0.0	0:02

**Results****Melting temperature:**

No melting point was found between 20°C and 500°C.

**Observed thermic processes:**

No other thermic processes were observed.

To survey the thermic behaviour of the test item the measurement was run up to 500°C. Exothermic decomposition was not observed (Test 2).

The estimated accuracy is  $\pm 1^\circ\text{C}$ .

**Diagram**

For DSC-diagram 20°C to +500°C (Test 2) see page 17.

**Date of Test**

May 17 – 18, 2011

**Head of Laboratory****2 Boiling Point****Summary**

DSC-measurements show no melting point of the test item below 500°C. Therefore the normal boiling point cannot be determined.

**Method**

The vapour pressure of the test item is too low so the dynamic method according to OECD Guideline for the Testing of Chemicals 103 is not suitable. Therefore the determination of the normal boiling point was carried out via vapour pressure measurement by effusion method, weight loss, according to OECD Guideline for the Testing of Chemicals 104.

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## Physico-chemical properties of "Palligen Violet 5011"

Study No. 11L00105 (confidential)

**Results**

Temperature t/°C	Vapour pressure, p/hPa	
	Cell 2	Cell 10
52.3	$3.47 \cdot 10^{-5}$	$2.88 \cdot 10^{-5}$
53.6	$2.46 \cdot 10^{-6}$	$2.12 \cdot 10^{-6}$
53.1	$< 1 \cdot 10^{-6}$	$< 1 \cdot 10^{-6}$

In the temperature range used for vapour pressure measurements the test item was solid.

Vapour pressures were calculated using a molar mass of 390.35 g/mol.

DSC-measurements show no melting point of the test item between 20°C and 500°C (see section 1). Therefore the boiling point cannot be determined.

**Date of Test**

May 10 – 17, 2011

**Head of Laboratory**

[REDACTED]

**3 Vapour Pressure****Summary** $p_{20^\circ\text{C}} < 1 \cdot 10^{-6}$  hPa,  $p_{25^\circ\text{C}} < 1 \cdot 10^{-6}$  hPa,  $p_{50^\circ\text{C}} < 1 \cdot 10^{-6}$  hPa**Method**

The vapour pressure was determined by effusion method, weight loss, according to OECD Guideline for the Testing of Chemicals 104.

**Results**

Temperature t/°C	Vapour pressure, p/hPa	
	Cell 2	Cell 10
52.3	$3.47 \cdot 10^{-5}$	$2.88 \cdot 10^{-5}$
53.6	$2.46 \cdot 10^{-6}$	$2.12 \cdot 10^{-6}$
53.1	$< 1 \cdot 10^{-6}$	$< 1 \cdot 10^{-6}$

In the temperature range used for vapour pressure measurements the test item was solid.

Vapour pressures were calculated using a molar mass of 390.35 g/mol.

At the temperature applied the vapour pressure descended perpetually at constant temperature and reached the identification limit of the most sensitive measurement technique.

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## Physico-chemical properties of "Paliogen Violet 5011"

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Temperature $t/^{\circ}\text{C}$	Vapour pressure $p/\text{hPa}$
20	$< 1 \cdot 10^{-6}$
25	$< 1 \cdot 10^{-6}$
50	$< 1 \cdot 10^{-6}$

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Date of Test May 10 – 17, 2011

Head of Laboratory 

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4 Relative DensitySummary  $D_4^{20} = 1.584$ 

Method The determination was carried out in accordance with OECD Guideline for the Testing of Chemicals 109, pycnometer method.

Principle The density was measured by the pycnometer method, using petroleum as displacement liquid.

Apparatus Pycnometer with a volume of about 25 cm<sup>3</sup>, officially calibrated Balance (Mettler AT 250)  
Thermostat with an accuracy of  $\pm 0.02^{\circ}\text{C}$  (Lauda RC 6 CP)  
Digital thermometer (Systemtechnik S 1220)  
Oscillating densitometer, calibrated with water and air (Anton Paar DMA 4500 M)  
Plastic syringe 5 ml

Reagents Petroleum (Roth); water (ELGA-system).

Results Density determination of the displacement liquid:  
The density was determined using the oscillating densitometer.  
Result: 0.7973 g/cm<sup>3</sup>

The measurements were carried out at 20°C.

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## Density determination of the test item:

		1 <sup>st</sup> determination	2 <sup>nd</sup> determination
A	mass of pycnometer empty (corrected for air)	31.9870	38.5339
B	mass of pycnometer with test item (corrected for air)	34.1178	40.9884
C	mass of pycnometer with test item and displacement liquid	53.5460	59.6300
D	mass of displacement liquid calculated for the total pycnometer volume	20.4994	19.8783
E	mass of test item (B - A)	2.1308	2.4545
F	mass of displacement liquid (C - B)	19.4282	18.6416
G	mass of displacement liquid calculated for the volume taken by the test item (D - F)	1.0712	1.2367
H	density of the test item (E/G • density of displacement liquid)	1.58596 g/cm <sup>3</sup>	1.58246 g/cm <sup>3</sup>
I	relative density (H/density of water at 4°C) (mean)	1.584	

volume of 1<sup>st</sup> pycnometer: 25.711 cm<sup>3</sup>; volume of 2<sup>nd</sup> pycnometer: 24.932 cm<sup>3</sup>

Masses are listed in gram. Results are calculated with not rounded single values.

Measuring temperature = 20 °C

The relative density was calculated by division of the density of test item at 20°C and the density of water at 4°C.

The test item is solid at room temperature.

$$D_4^{20} = 1.584$$

The estimated accuracy is  $\pm 0.005$ .

Date of Test

April 5 – 6, 2011

Head of Laboratory





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**5 Surface Tension****Summary**

According to OECD Guideline for the Testing of Chemicals 115, the surface tension of the test item need not be determined, because the water solubility is  $< 1 \text{ mg/l}$  ( $0.011 \text{ mg/l}$  at  $T = 20.0^\circ\text{C} \pm 0.5^\circ\text{C}$ ).

For water solubility see section 6.

**Head of Laboratory****6 Water Solubility****Summary**

The water solubility of the test item is  $0.011 \pm 0.005 \text{ mg/l}$  at  $T = 20.0^\circ\text{C} \pm 0.5^\circ\text{C}$ .

Theoretical value<sup>1</sup>:  $0.169 \text{ mg/l}$  at  $25^\circ\text{C}$

**Physical State**

The test item is solid at room temperature.

**Pre-testing**

Mixtures of the test item with water were prepared at different concentrations. After agitating on a roller mixer or stirring at room temperature ( $23^\circ\text{C}$ ) overnight, the preparations were visually checked:

Weight of test item [mg]	Volume of water added [ml]	Sample size	Observation / Treatment
107.56	10	10.8 g/l	not dissolved after rolling overnight
96.99	100	0.97 g/l	not dissolved after stirring overnight
7.90	100	0.08 g/l	not dissolved after stirring overnight
4.93	500	9.9 mg/l	not dissolved after stirring overnight

Thus the water solubility was estimated to be  $< 10 \text{ mg/l}$ .

<sup>1</sup> calculation of water solubility was done with EPIWIN (EPI Suite™) -software, v. 4.00, [REDACTED] Corp., ©2000-2008 U.S. Environmental Protection Agency

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## Physico-chemical properties of "Paliogen Violet 5011"

Study No. 11L00105 (confidential)

**Method**

The determinations were done according to OECD Guideline for the Testing of Chemicals 105, flask method (due to the poor solubility of the test item in common volatile organic solvents the column elution method could not be applied).

**Reagents**

Demineralized water (Milli-Q System); buffer solution pH = 4.008 ( ) and buffer solution pH = 9.184 ( ) for testing of pH-meter; concentrated sulfuric acid ( ).

**Analytical Method**

26.77 to 27.13 mg of test item and 250 ml of demineralized water were stirred at 30°C for 24, 48 and 72 h. Afterwards the mixtures were conditioned at 20.0°C ± 0.5°C for 24 h and then filtrated. After filtration (first with RC 58 0.2 µm, Schleicher & Schuell and then with Anopore 0.02 µm, Whatman) aliquots (each 100 ml) were evaporated to dryness and the residues dissolved in 10 ml of concentrated sulfuric acid (shaken for about five minutes). The solutions were measured against concentrated sulfuric acid as reference by means of UV/VIS spectrometry with external calibration.

For calibration (order no. 11D00027 from Competence Center Analytics, BASF SE, not GLP) the test item was dissolved in concentrated sulfuric acid and measured against concentrated sulfuric acid as reference.

Instrument: UV/VIS spectrometer Perkin Elmer Lambda 900 (Lambda II)

## Measuring parameters:

Wavelength: 200 – 800 nm, evaluation at  $\lambda = 595$  nm  
 Slit width: 2.0 nm  
 Cuvette: quartz glass  
 Optical path: 5.0 cm

**Individual Results**

Sample	m <sub>test item</sub> [mg]	V <sub>water</sub> [ml]	pH	C <sub>test item</sub> single values [mg/l]	C <sub>test item</sub> mean [mg/l]
water used			6.0	< 0.003	
1-24 h	26.77	250	5.9	0.008 0.006	0.007
2-48 h	27.13	250	6.0	0.020 0.009	0.015
3-72 h	26.99	250	6.0	0.013 0.008	0.011
Mean of all single values ± std. dev.				0.011 ± 0.005 mg/l	

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## Physico-chemical properties of "Paliogen Violet 5011"

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**Result** The water solubility of the test item is 0.011 mg/l  $\pm$  0.005 mg/l at T = 20.0 °C  $\pm$  0.5 °C.

**Date of Test** April 5 – June 28, 2011

**Head of Laboratory** [REDACTED]

**7 Partition Coefficient n-Octanol / Water ( $P_{ow}$ )**

**General** The water solubility of the test item is insufficient (0.011 mg/l, see section 6), so the determination of the log  $P_{ow}$  corresponding to the OECD Guideline for the Testing of Chemicals 107 (shake flask method) is not feasible. Because the test item cannot be chromatographed under the prescribed conditions the HPLC-method (OECD Guideline for the Testing of Chemicals 117) is also not feasible. Due to this, the log  $P_{ow}$  can only be estimated from the single solubilities of the test item in water and in n-octanol.

**Summary** The  $P_{ow}$  of the test item cannot be determined according to the shake flask method (OECD Guideline 107), because of the poor solubility in water and in n-octanol as well. The HPLC method (OECD-Guideline 117) is also not suitable to determine  $P_{ow}$ , because the test item cannot be chromatographed under the prescribed conditions.

*Estimation via the single solubilities in n-octanol and in water:*  
log  $P_{ow}$  < 1

The n-octanol solubility of the test item at T = 20.0°C  $\pm$  0.5 °C is < 0.07 mg/l.

Theoretical value<sup>2</sup>: 3.76

**Physical State** At room temperature (23°C) the test item is solid.

**7.1 Water Solubility** The water solubility of the test item is 0.011  $\pm$  0.005 mg/l at T = 20.0 °C  $\pm$  0.5 °C (see section 6).

**7.2 Solubility in n-octanol**

**Summary** The n-octanol solubility of the test item at T = 20.0°C  $\pm$  0.5°C is < 0.07 mg/l.

<sup>2</sup> calculation of log  $P_{ow}$  was done with EPIWIN (EPI Suite™) -software, v. 4.00, [REDACTED]  
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## Physico-chemical properties of "Paliogen Violet 5011"

Study No. 11L00105 (confidential)

## Reagents

n-octanol (Merck, for pre-testing: Sigma Aldrich); concentrated sulfuric acid (Bernd Kraft)

## Pre-testing

Mixtures of the test item with n-octanol were prepared at different concentrations. After shaking on a shaking machine or stirring at room temperature (23 °C) over the weekend, the preparations were visually checked:

Weight of test item [mg]	Volume of n-octanol added [ml]	Sample size	Observation
93.05	10	9.31 g/l	not dissolved after shaking over the weekend
104.07	100	1.04 g/l	not dissolved after stirring over the weekend
12.93	100	0.13 g/l	not dissolved after stirring over the weekend
10.28	1000	10.28 mg/l	not dissolved after stirring over the weekend

Thus the n-octanol solubility was estimated to be < 10 mg/l.

## Method

The determinations were done according to OECD Guideline for the Testing of Chemicals 105, flask method.

## Analytical Method

6.80 to 10.05 mg of the test item and 100 ml of n-octanol were stirred at 30°C for 24, 48 and 72 h. Afterwards the mixtures were conditioned at 20.0 °C ± 0.5 °C for 24 h and then the supernatant solutions were filtered (first using 0.45 µm filter "Grünrand" REZIST 30, Whatman and then 0.02 µm filter Anaport 25 plus, Whatman). The content of the test item in the samples was analyzed by means of UV/VIS spectrometry with external calibration against n-octanol as reference. For calibration amounts of the test item were dissolved in concentrated sulfuric acid applying ultrasound, diluted in n-octanol and measured against n-octanol with 1 % concentrated sulfuric acid as reference.

Instrument:

UV/VIS spectrophotometer Agilent 8453

Measuring parameters:

Wavelength: 350 – 800 nm, evaluation at  $\lambda \sim 577$  nm  
Interval: 1.0 nm  
Cuvette: quartz glass  
Optical path: 5.0 cm



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## Physico-chemical properties of "Paliogen Violet 5011"

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## Individual Results

Sample	m <sub>test item</sub> [mg]	V <sub>n-octanol</sub> [ml]	C <sub>test item</sub> * single values [mg/l]	C <sub>test item</sub> mean [mg/l]
1 / 24 h	10.05	100	< 0.07 < 0.07	< 0.07
2 / 48 h	6.80	100	< 0.07 < 0.07	< 0.07
3 / 72 h	7.28	100	< 0.07 < 0.07	< 0.07
Mean of all single values			< 0.07 mg/l	

\* The limit of detection as calculated from the calibration data was stated as final result.

## Result

The n-octanol solubility of the test item at T = 20.0°C ± 0.5 °C is < 0.07 mg/l.

7.3 Estimation of log P<sub>ow</sub>

With a water solubility of 0.011 mg/l (see section 6) and a solubility of < 0.07 mg/l in n-octanol (see section 7.2), the log P<sub>ow</sub> can be estimated from the single solubilities as:

$$P_{ow} = \frac{c_{n-octanol}}{c_{water}} = \frac{< 0.07 \text{ mg/l}}{0.011 \text{ mg/l}} < 6.4$$

log P<sub>ow</sub> < 1 (estimated from the single solubilities in n-octanol and in water)

## Date of Test

April 1 – November 24, 2011

## Head of Laboratory


8 Dissociation Constant (pK<sub>a</sub>)

## Summary

Due to its chemical structure the test item is not soluble in water (0.011 mg/l; see section 6). The determination of the dissociation constant of an aqueous preparation of the test item, according to OECD Guideline for the Testing of Chemicals 112, is not feasible.

## Head of Laboratory



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## Physico-chemical properties of "Paliogen Violet 5011"

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**9 Particle Size Distribution****Summary**

d(0.1): 5.9 µm      D[3,2]: 16.9 µm  
d(0.5): 46.9 µm      D[4,3]: 232 µm  
d(0.9): 806 µm

&lt; 100 µm: 64.6 %; &lt; 10 µm: 18.5 % &lt; 4 µm: 5.1 %

**Method**

The determination of the particle size distribution was carried out by laser diffraction according to ISO 13320-1, with evaluation according to Fraunhofer.

**Apparatus**

Laser diffraction instrument Mastersizer 2000 supplied by Malvern, equipped with the dispersion unit Scirocco 2000

**Sample Preparation**

The test item was transferred into the joggle channel of the disperser; transportation was activated and then measured by laser diffraction method.

**Test Parameters**

Measuring time 4 sec  
Scattering model Fraunhofer  
Measuring range 0.020 to 2000 µm  
Transport rate 50 %  
Disperser pressure 0 bar

**Results in Detail**

Measurement	d(0.1) [µm]	d(0.5) [µm]	d(0.9) [µm]	D[3,2] [µm]	D[4,3] [µm]
1	5.464	36.371	537.919	15.030	157.935
2	6.600	64.417	1008.497	19.266	305.209
Mean <sup>*)</sup>	5.9	46.9	806.3	16.9	231.6

<sup>\*)</sup> Using all single measuring points from the distributions 1 and 2, a new distribution was calculated, giving the mean values for each parameter.

&lt; 100 µm: 64.6 %; &lt; 10 µm: 18.5 % &lt; 4 µm: 5.1 %

**Figures**

Cumulative distribution plot (mean of measurements 1 and 2)  
see page 18.

**Date of Test**

November 28, 2011

**Head of Laboratory**

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January 31, 2013

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Date

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Rheinland-Pfalz

LANDESAMT FÜR UMWELT,  
WASSERWIRTSCHAFT UND  
GEWERBEAUFICHT

**GUTE LABORPRAXIS – GOOD LABORATORY PRACTICE**  
**GLP-BESCHEINIGUNG**  
**STATEMENT OF GLP COMPLIANCE**  
 gem./according to § 19 Abs. 1 Chemikaliengesetz

Eine GLP-Inspektion zur Überwachung der Einhaltung der GLP-Grundsätze gemäß Chemikaliengesetz bzw. Richtlinie 2004/9/EG wurde durchgeführt in: Assessment of conformity with GLP according to Chemikaliengesetz and Directive 2004/9/EC at

**Prüfeinrichtung / Test facility**

**BASF SE**  
**Kompetenzzentrum Analytik**  
**67056 Ludwigshafen**

**Prüfung nach Kategorien / Areas of Expertise**  
 (gem. / according ChemVwV-GLP Nr. 5.3/OECD guidance)

1

**Datum der Inspektion / Date of inspection**

09. bis 11.09.2009 (Tag/Monat/Jahr / day/month/year)

Die genannte Prüfeinrichtung befindet sich im nationalen GLP-Überwachungsverfahren und wird regelmäßig auf Einhaltung der GLP-Grundsätze überwacht.

Auf der Grundlage des Inspektionsberichtes wird hiermit bestätigt, dass in dieser Prüfeinrichtung die oben genannten Prüfungen unter Einhaltung der GLP-Grundsätze durchgeführt werden können.

Eine erneute behördliche Überprüfung der Einhaltung der GLP-Grundsätze durch die Prüfeinrichtung ist so rechtzeitig zu beantragen, dass die Folgeinspektion spätestens vier Jahre nach dem Beginn der o.g. Inspektion stattfinden kann. Ohne diesen Antrag wird die Prüfeinrichtung nach Ablauf der Frist aus dem deutschen GLP-Überwachungsprogramm genommen und diese GLP-Bescheinigung verliert ihre Gültigkeit.

The above mentioned test facility is included in the national GLP Compliance Programme and is inspected on a regular basis.

Based on the inspection report it can be confirmed, that the test facility is able to conduct the aforementioned studies in compliance with the Principles of GLP.

Verification of the compliance of the test facility with the Principles of the GLP has to be applied for in time to allow for a follow-up inspection to take place within four years after commencing the above mentioned inspection. Elapsing this term, the test facility will be taken out of the German GLP-Monitoring Programme and this GLP Certificate becomes invalid.

Siegel

Datum / Signature, Date

26.09.2009

Präsident -

(Name und Funktion der verantwortlichen  
 name and function of responsible person)

Landesamt für Umwelt, Wasserwirtschaft und Gewerbeaufsicht

(Name und Adresse der GLP-Überwachungsbehörde /  
 Name and address of the GLP Monitoring Authority)

MESSEN  
 BEWERTEN  
 BERATEN





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GLP Compliance Statement

This study was conducted in accordance with the OECD Principles of Good Laboratory Practice and the GLP Principles of the German "Chemikaliengesetz" (Chemicals Act).

  
Study director

*January 31, 2013*  
Date

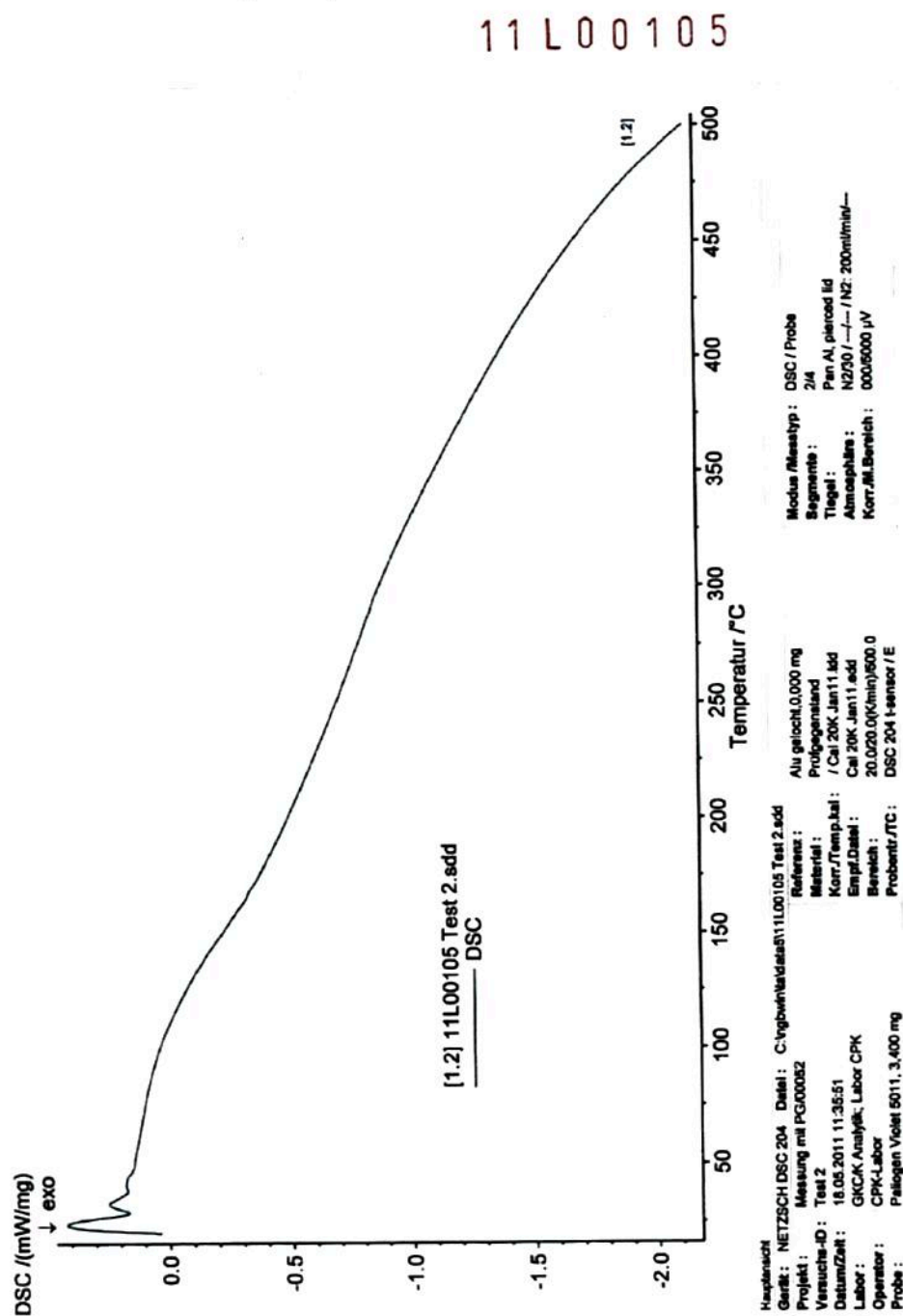
## Final Report

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## Physico-chemical properties of "Paliogen Violet 5011"

Study No. 11L00105 (confidential)

## DSC diagram 20°C to +500°C (Test 2)



## Final Report

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## Physico-chemical properties of "Paliogen Violet 5011"

Study No. 11L00105 (confidential)

## Particle Size Distribution: Cumulative distribution plot (mean of measurements 1 and 2)

Partikelmesstechnik



BASF Kompetenzzentrum Analytik GKCV-KON Tel.58046

MASTERSIZER



## Analysen Report

 Probenbezeichnung:  
Paliogen Violet 5011 Mw. aus 509+510

11L00105

SOP Name:

 Datenursprung:  
Averaged

Gemessen:

Montag, 28. November 2011 08:20:40

Berechnet:

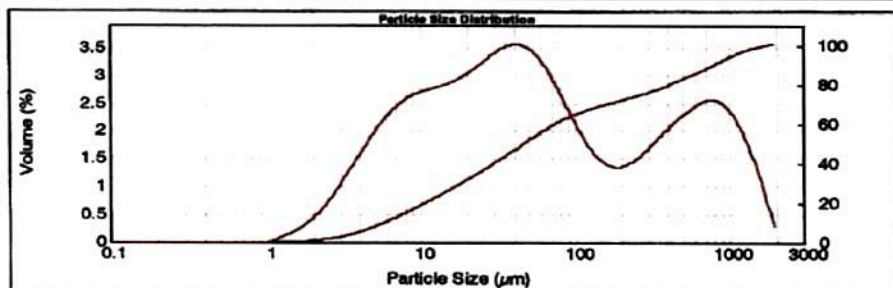
Montag, 28. November 2011 08:20:42

Operator name : [REDACTED]

 Messung in Kundenauftrag  
TR: 50%; PMZ: 4 sek.  
Fr. Huwe, E-EDCOP - J550

[REDACTED] 23.11.11

Probenmaterial: Fraunhofer	Dispersionsmodul: Scirocco 2000	Analysenmodell: General purpose	Analysensensitivität: Normal
Partikelgröße: 0.000	Absorption: Medium RT: Dry dispersion 1.000	Messbereich: 0.020 to 2000.000 $\mu\text{m}$ Dispersionsdruck: 0 bar Feed rate: 50 %	Ergebnisemulation: Off Abschattung: 2.85 % RT: 0.192 %
Ergebnisberechnungstyp: Volume	Gleichförmigkeit: 4.56	Oberflächengewichteter Mittelwert D[3,2]: 16.887 $\mu\text{m}$	
Konzentration: 0.0017 %Vol	Breite: 17.081	Spezifische Oberfläche: 0.355 $\text{m}^2/\text{g}$	Volumengewichteter Mittelwert D[4,3]: 231.572 $\mu\text{m}$
d(0.1): 5.940 $\mu\text{m}$	d(0.5): 46.858 $\mu\text{m}$	d(0.9): 806.336 $\mu\text{m}$	



Paliogen Violet 5011 Mw. aus 509+510, Montag, 28. November 2011 08:20:40

Size (μm)	Vol Under %	Size (μm)	Vol Under %	Size (μm)	Vol Under %	Size (μm)	Vol Under %	Size (μm)	Vol Under %	Size (μm)	Vol Under %
0.010	0.00	0.100	0.00	1.000	0.00	10.000	0.00	100.000	0.00	1000.000	0.00
0.011	0.00	0.110	0.00	1.100	0.00	11.000	0.00	110.000	0.00	1100.000	0.00
0.013	0.00	0.130	0.00	1.300	0.00	13.000	0.00	130.000	0.00	1300.000	0.00
0.015	0.00	0.150	0.00	1.500	0.00	15.000	0.00	150.000	0.00	1500.000	0.00
0.017	0.00	0.170	0.00	1.700	0.00	17.000	0.00	170.000	0.00	1700.000	0.00
0.020	0.00	0.200	0.00	2.000	0.00	20.000	0.00	200.000	0.00	2000.000	0.00
0.022	0.00	0.220	0.00	2.200	0.00	22.000	0.00	220.000	0.00	2200.000	0.00
0.025	0.00	0.250	0.00	2.500	0.00	25.000	0.00	250.000	0.00	2500.000	0.00
0.028	0.00	0.280	0.00	2.800	0.00	28.000	0.00	280.000	0.00	2800.000	0.00
0.030	0.00	0.300	0.00	3.000	0.00	30.000	0.00	300.000	0.00	3000.000	0.00
0.033	0.00	0.330	0.00	3.300	0.00	33.000	0.00	330.000	0.00	3300.000	0.00
0.036	0.00	0.360	0.00	3.600	0.00	36.000	0.00	360.000	0.00	3600.000	0.00
0.040	0.00	0.400	0.00	4.000	0.00	40.000	0.00	400.000	0.00	4000.000	0.00
0.045	0.00	0.450	0.00	4.500	0.00	45.000	0.00	450.000	0.00	4500.000	0.00
0.050	0.00	0.500	0.00	5.000	0.00	50.000	0.00	500.000	0.00	5000.000	0.00
0.055	0.00	0.550	0.00	5.500	0.00	55.000	0.00	550.000	0.00	5500.000	0.00
0.060	0.00	0.600	0.00	6.000	0.00	60.000	0.00	600.000	0.00	6000.000	0.00
0.065	0.00	0.650	0.00	6.500	0.00	65.000	0.00	650.000	0.00	6500.000	0.00
0.070	0.00	0.700	0.00	7.000	0.00	70.000	0.00	700.000	0.00	7000.000	0.00
0.075	0.00	0.750	0.00	7.500	0.00	75.000	0.00	750.000	0.00	7500.000	0.00
0.080	0.00	0.800	0.00	8.000	0.00	80.000	0.00	800.000	0.00	8000.000	0.00
0.085	0.00	0.850	0.00	8.500	0.00	85.000	0.00	850.000	0.00	8500.000	0.00
0.090	0.00	0.900	0.00	9.000	0.00	90.000	0.00	900.000	0.00	9000.000	0.00
0.095	0.00	0.950	0.00	9.500	0.00	95.000	0.00	950.000	0.00	9500.000	0.00
0.100	0.00	1.000	0.00	10.000	0.00	100.000	0.00	1000.000	0.00	10000.000	0.00

 Malvern Instruments Ltd.  
Malvern, UK

 Mastersizer 2000 Ver. 5.60  
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28.11.2011 08:26:38

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## Physico-chemical properties of "Pallogen Violet 5011"

Study No. 11L00105 (confidential)

**STATEMENT OF THE QUALITY ASSURANCE UNIT**

The QUALITY ASSURANCE UNIT inspects the laboratories of the department "Competence Center Analytics" in regular intervals. Besides these general inspections we inspected the following items of this study in accordance with the OECD Principles of GOOD LABORATORY PRACTICE and the GLP Principles of the German "Chemikaliengesetz" (Chemicals Act). Findings are reported to study director and to management.

Verification of study plan:

Mar 25, 2011

Inspection of	Date of inspection	Reported to study director and management
Raw data:	Jan 22-23 and Jan 29-31, 2013	Jan 31, 2013
Final report:	Jan 22-23 and Jan 29-31, 2013	Jan 31, 2013

The final report reflects the raw data.

Ludwigshafen

Jan 31, 2013  
Date