Calculation of Area of Substrate, Substance and Spheres

Interpretation Example

- Given that our **Area of Scan** = 10цm * 10цm => **100цm²**
- From Cellpose plus, we extract
  - Area of **Spheres** = 43.34 цm²
  - Area of **exclusively Substrate** = 39.38 цm²

    (i.e. Area without substance)
  - Area of Substance = (Total area of Scan – Area of exclusively substrate)
    - Therefore = 100 – 39.38 = **61.62цm²**

- Therefore, the metric Ratio of
- Area of Spheres/ Area of Substrate coated with Substance = 43.34/61.62

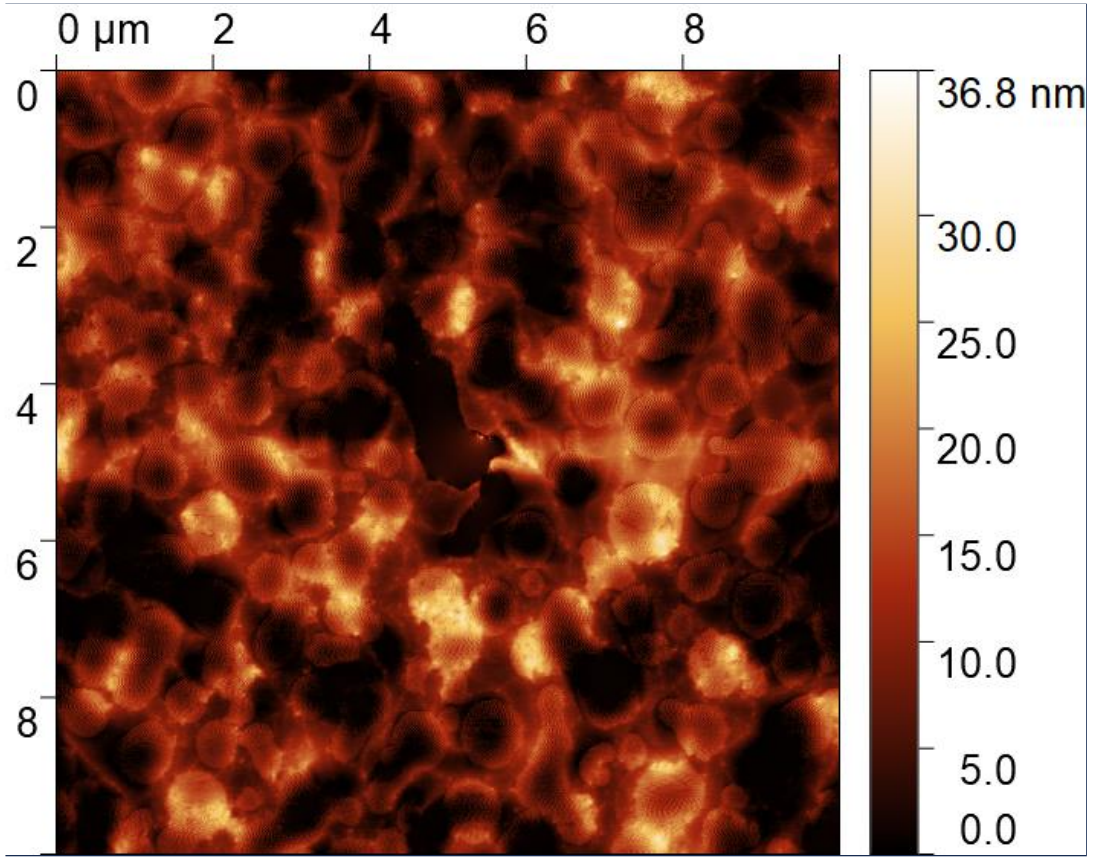
  = 0.703

Area of Spheres, Substance & Substrate - Summarized

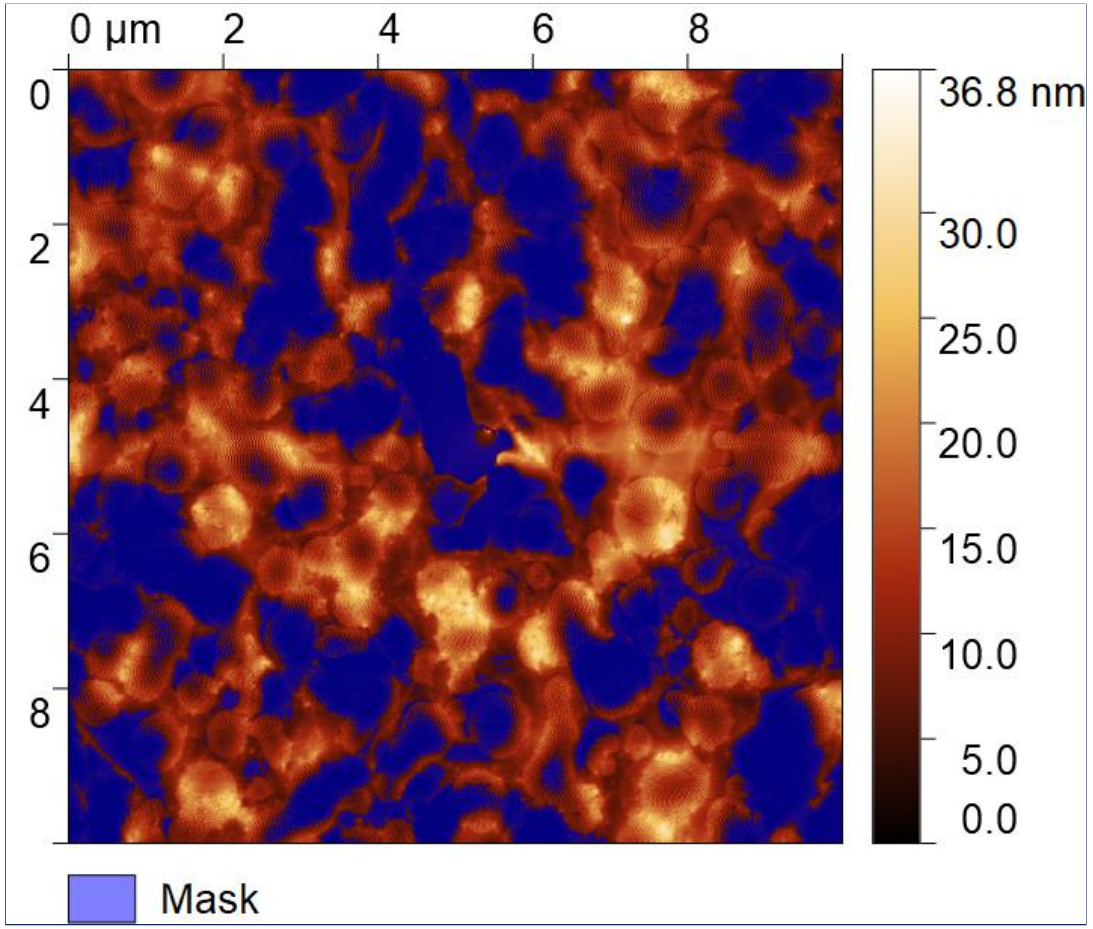
Sample	Area of Sphere (in um^2)	Area of Substrate(in um^2)	Area of Substance(in um^2)
А	44.24	18.38	81.62
Б	44.34	39.68	60.32
В	12.25	9.79	90.21
Г	32.81	0	100
Д	7.42	0	100
Е	3.34	0	100
Ж	45.1	5.46	94.54
З	3.91	0	100
И	0	0	100
К	43.23	3.34	96.66
Л	24.74	0	100
М	26.29	3.69	96.31
Н	24.74	0	100
О	0	5.82	94.18

(A)- 156 – $CHCl_3$ - 23°C – 23°C – 10^{-4}M

Original Image



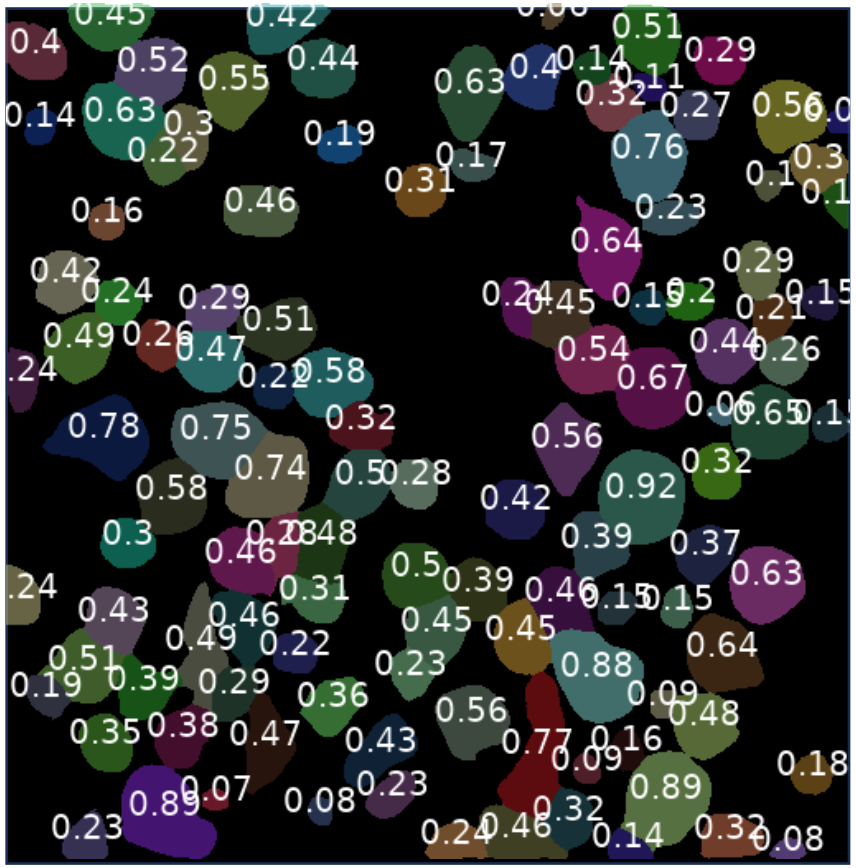
Gwyddion Mask



Masked %	**14.95**
Mask Height Value (µm)	**5.496**

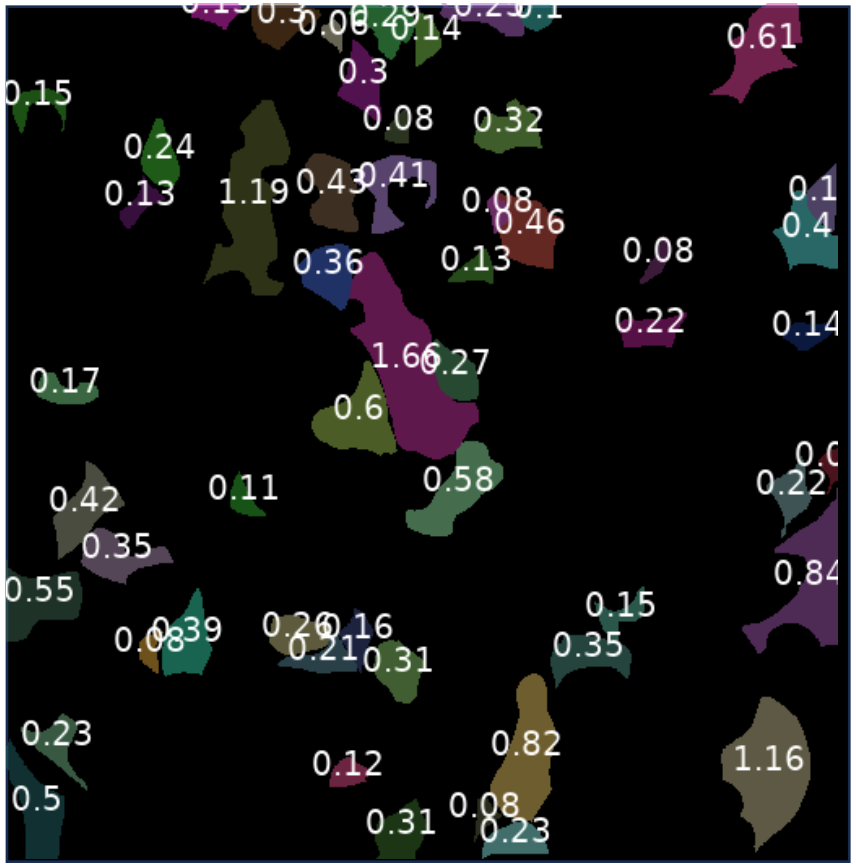
(A)- 156 – $CHCl_3$ - 23°C – 23°C – 10^{-4}M

Spheres



Area of Spheres = 44.24цm^2

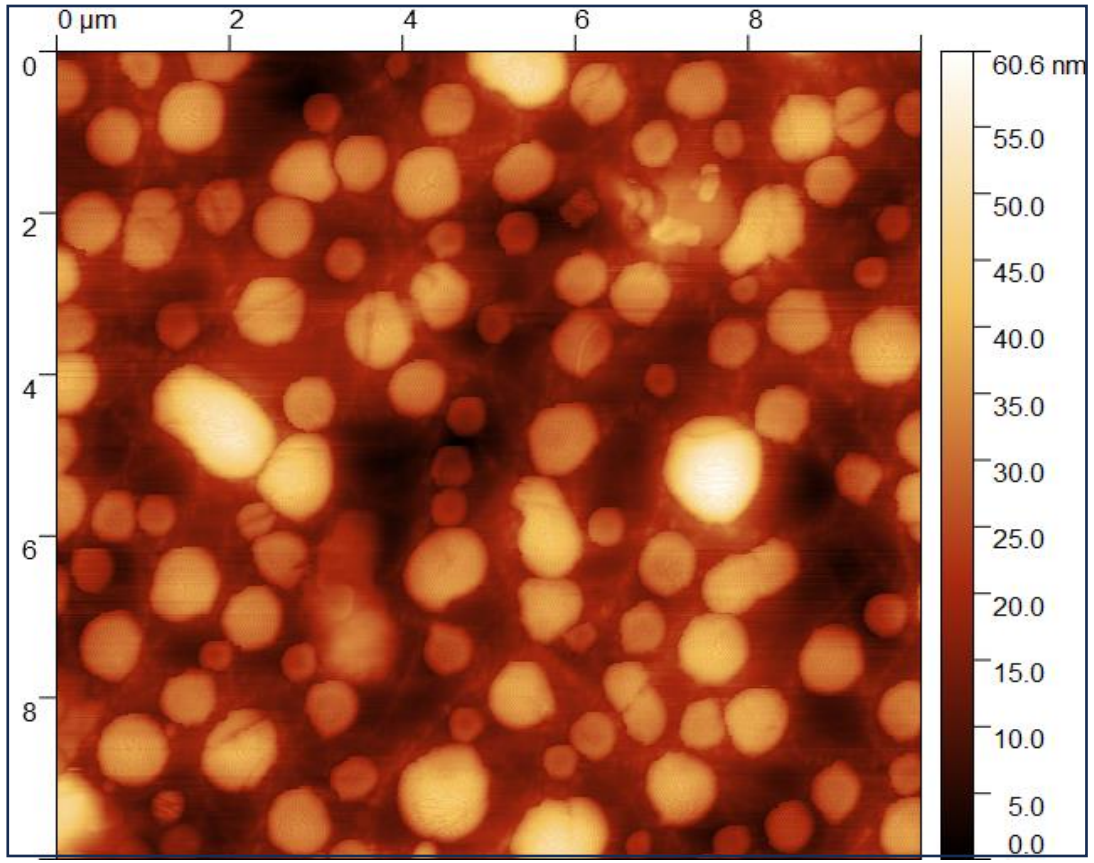
Substance



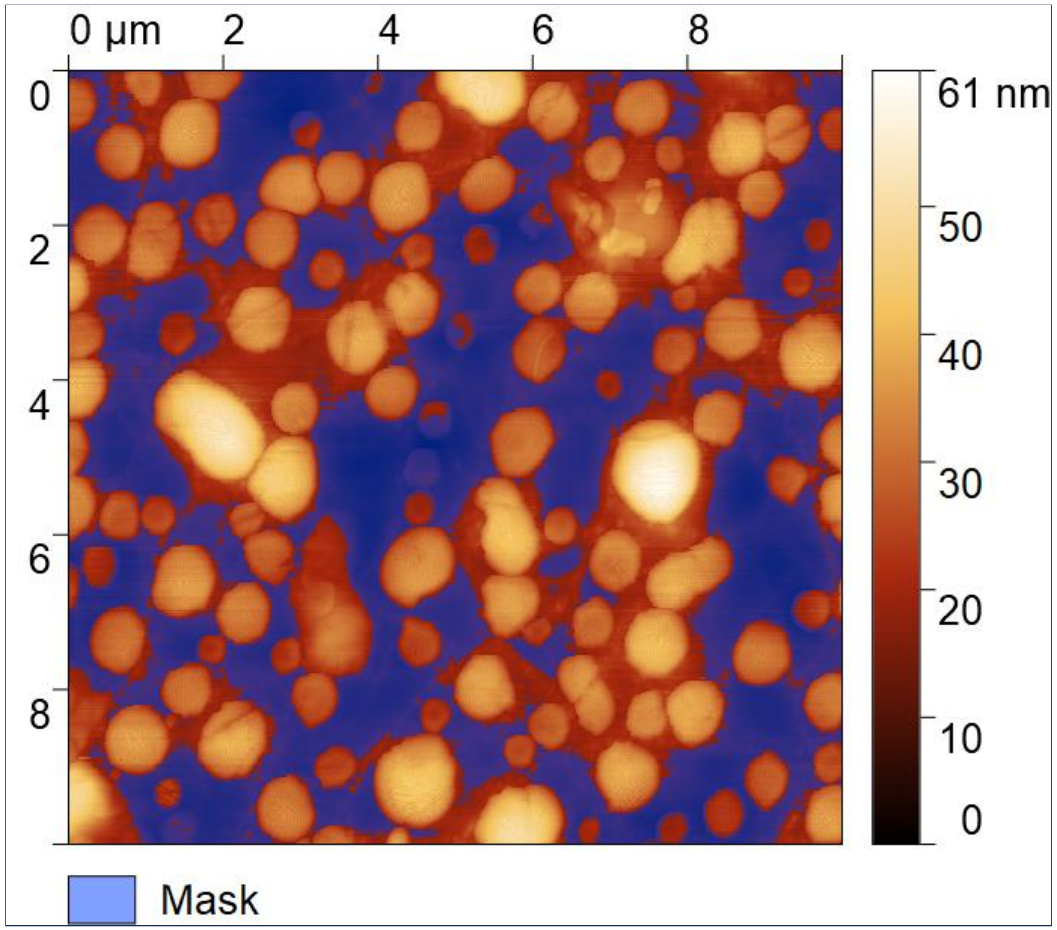
Area of Substrate = 18.38цm^2

(Б)- 156 – $CHCl_3$ – 23°C – 4°C – 10^{-4}M

Original Image



Gwyddion Mask

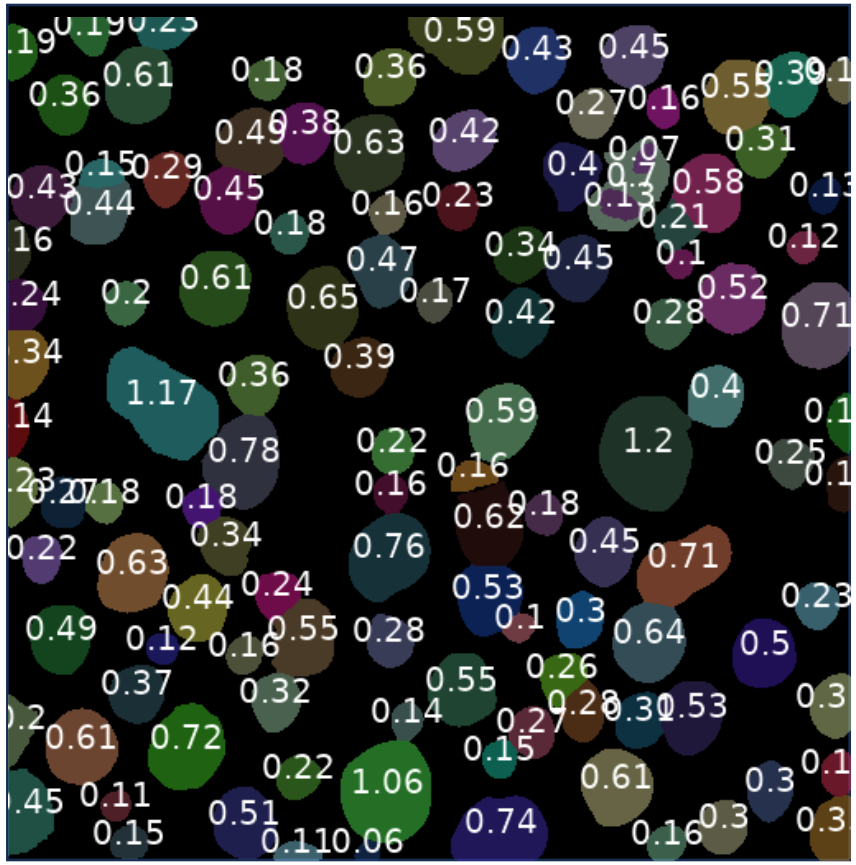


(Б)- 156 – $CHCl_3$ – 23°C – 4°C – 10^{-4}M

Masked %	**28.04**
Mask Height Value (µm)	**16.91**

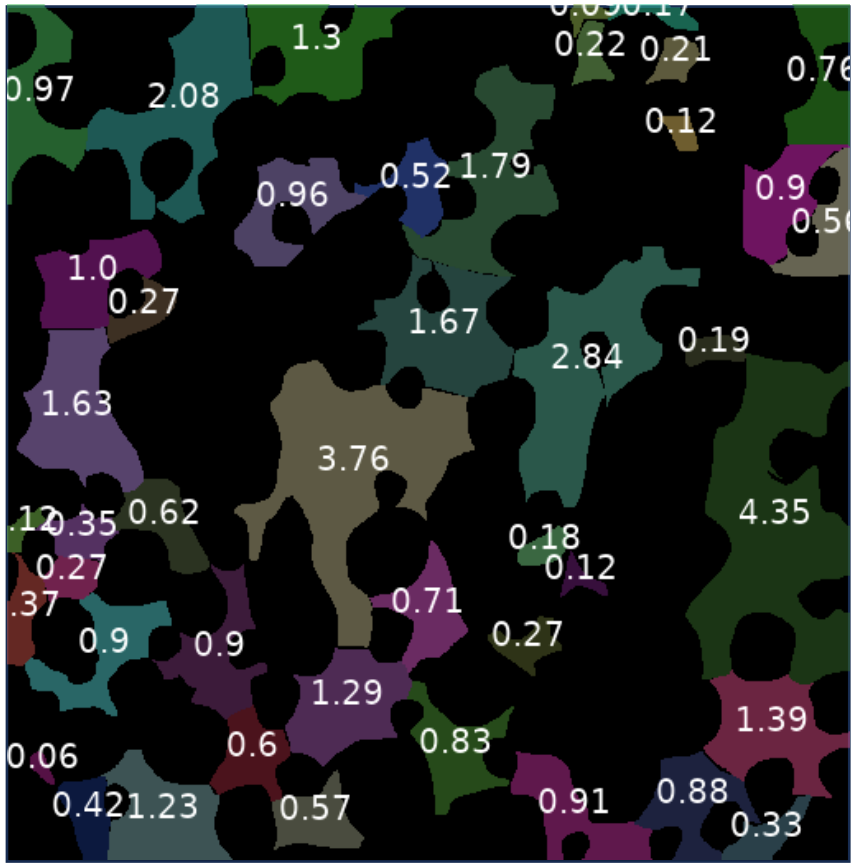
(Б)- 156 – $CHCl_3$ – 23°C – 4°C – 10^{-4}M

Spheres



Area of Spheres = **43.34цm²**

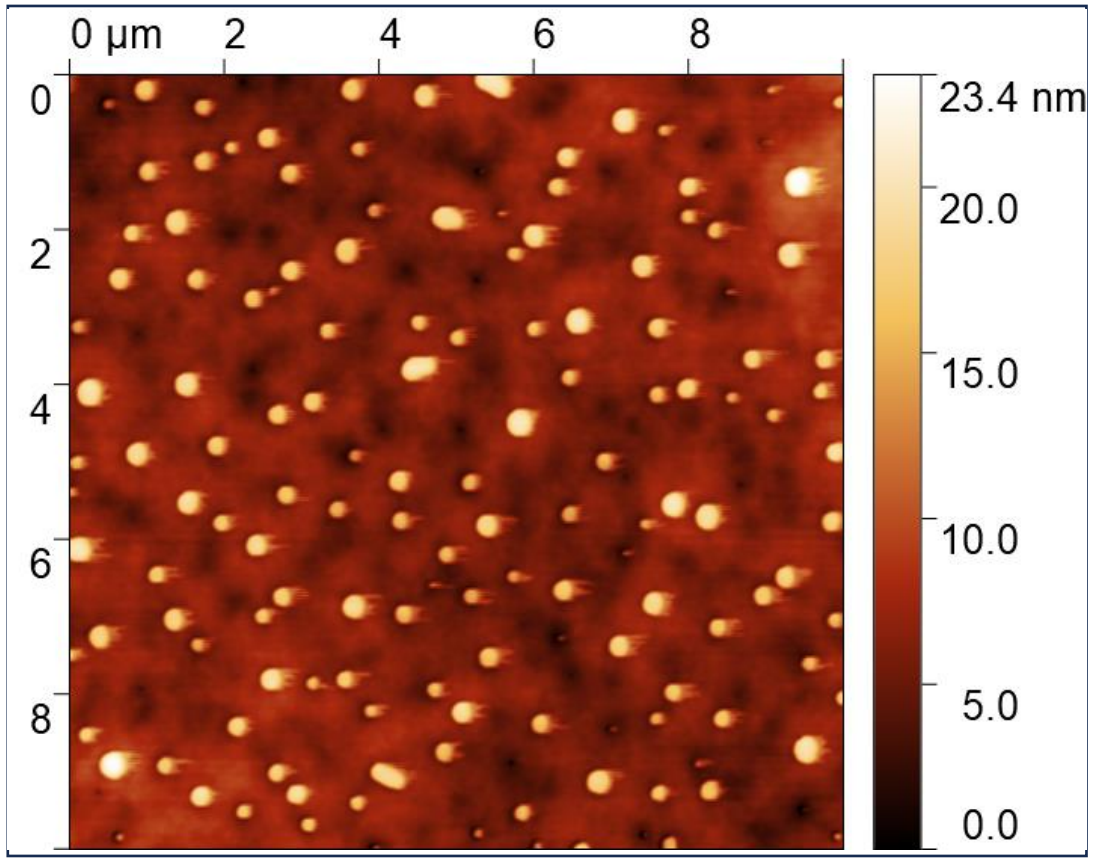
Substance



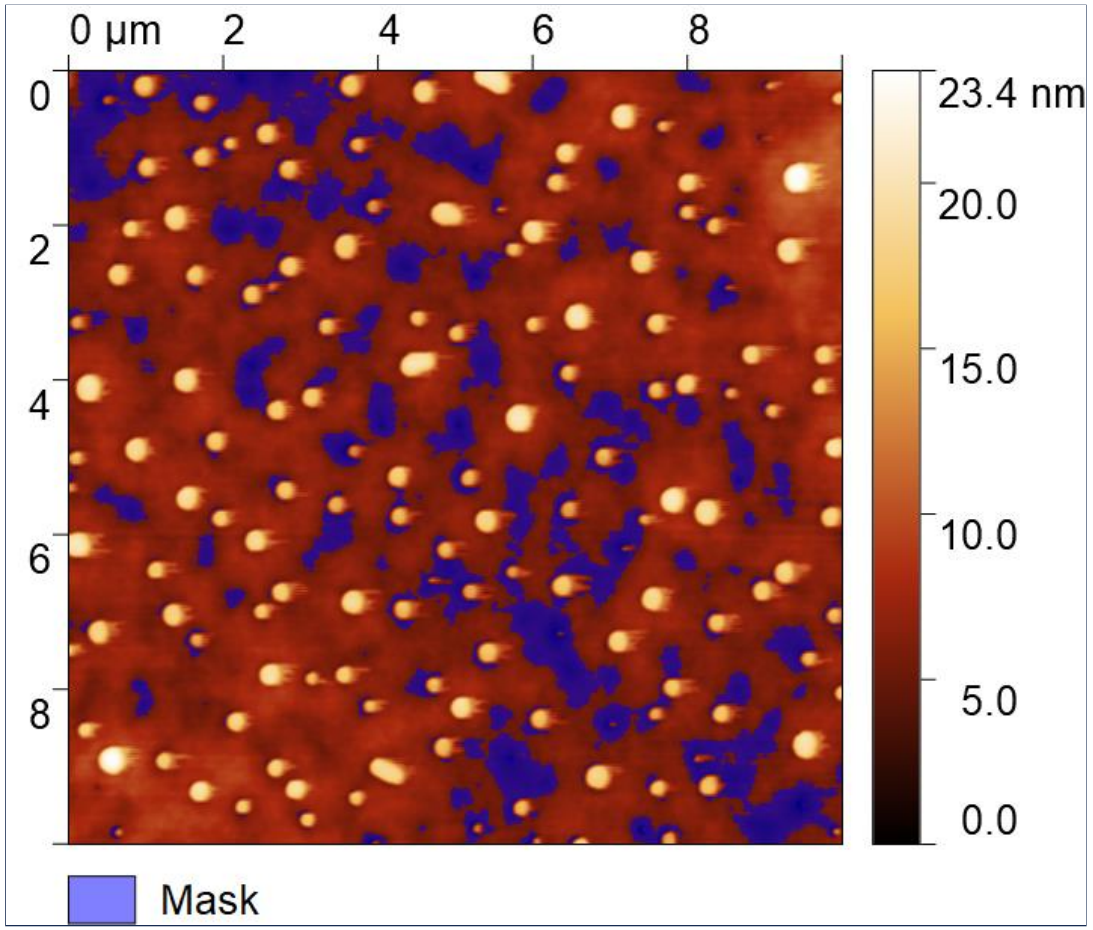
Area of Substrate = **39.68цm²**

(B)- 156 – $CHCl_3$ - 4°C – 23°C – 10^{-4}M

Original Image



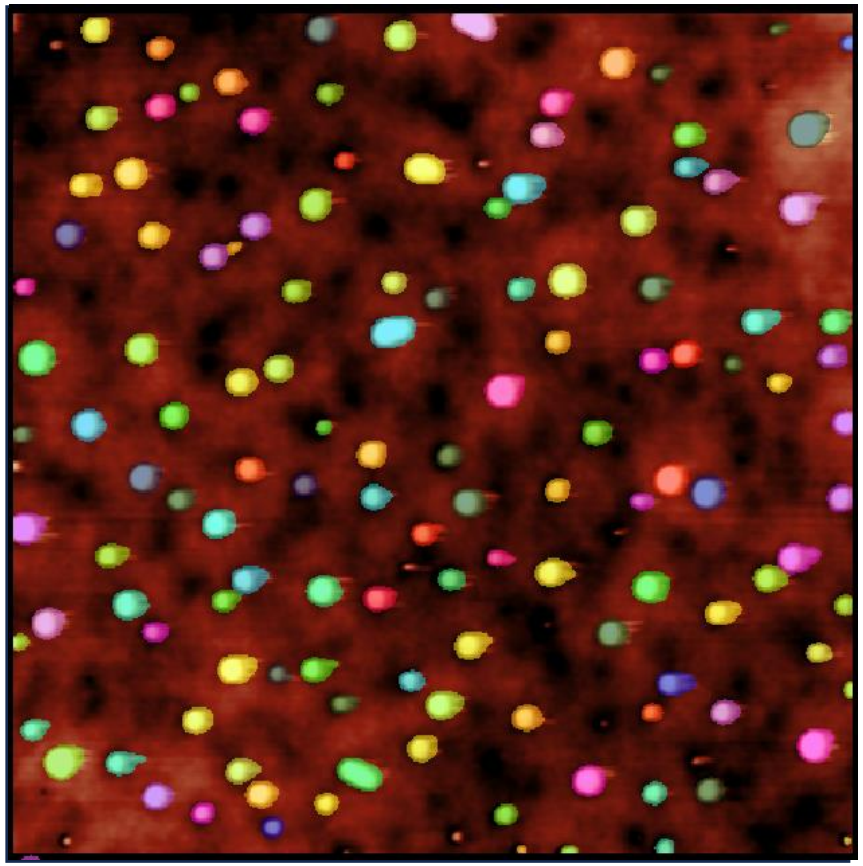
Gwyddion Mask



Masked %	**21.60**
Mask Height Value (µm)	**5.04**

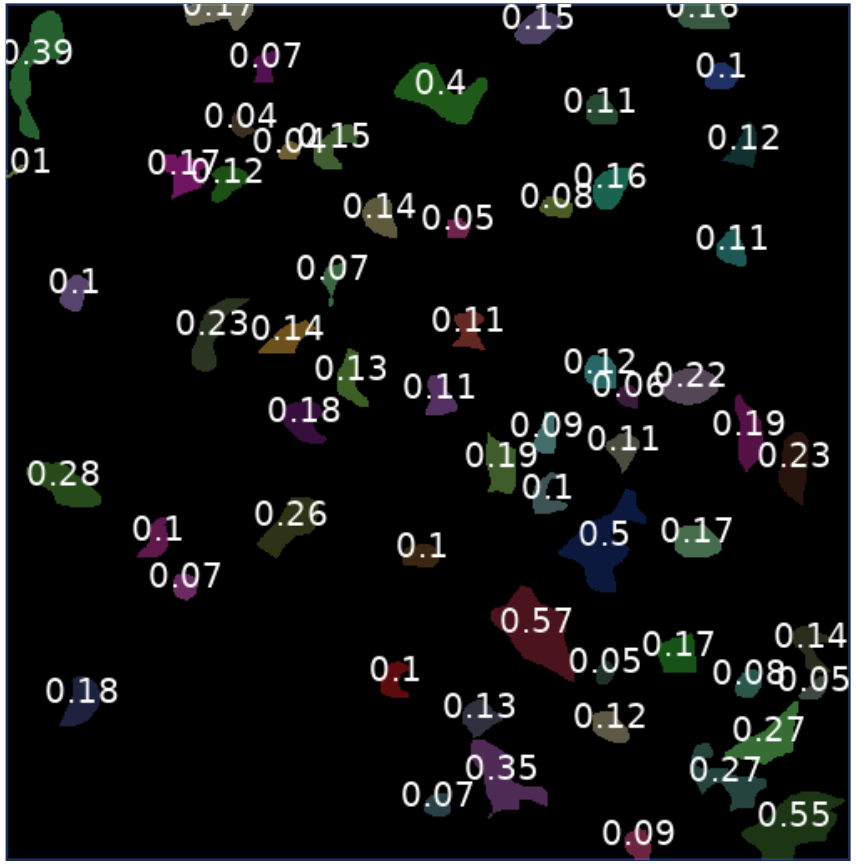
(B)- 156 – $CHCl_3$ - 4°C – 23°C – 10^{-4}M

Spheres



Area of Spheres = 12.25цm^2

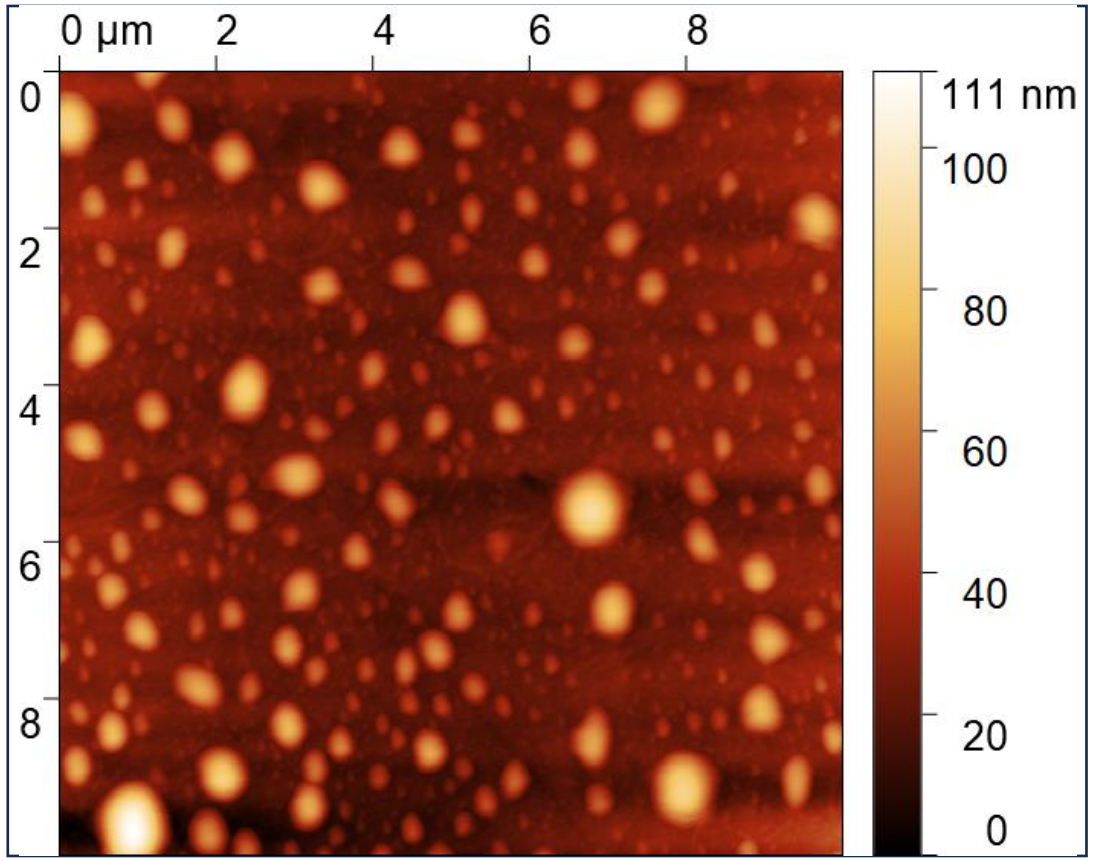
Substance



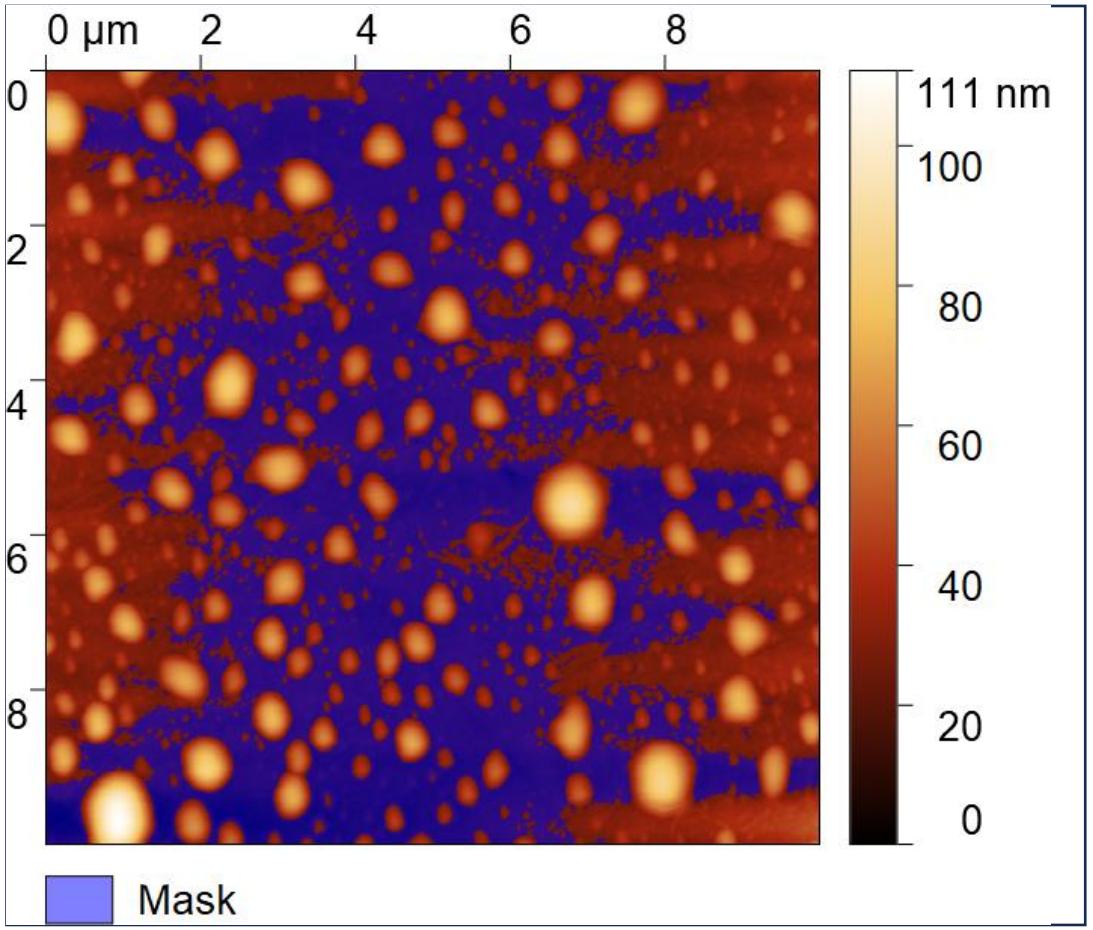
Area of Substrate = 9.79цm^2

(Г)- 156 – $CHCl_3$ - 23°C – 23°C – 10^{-5}M

Original Image



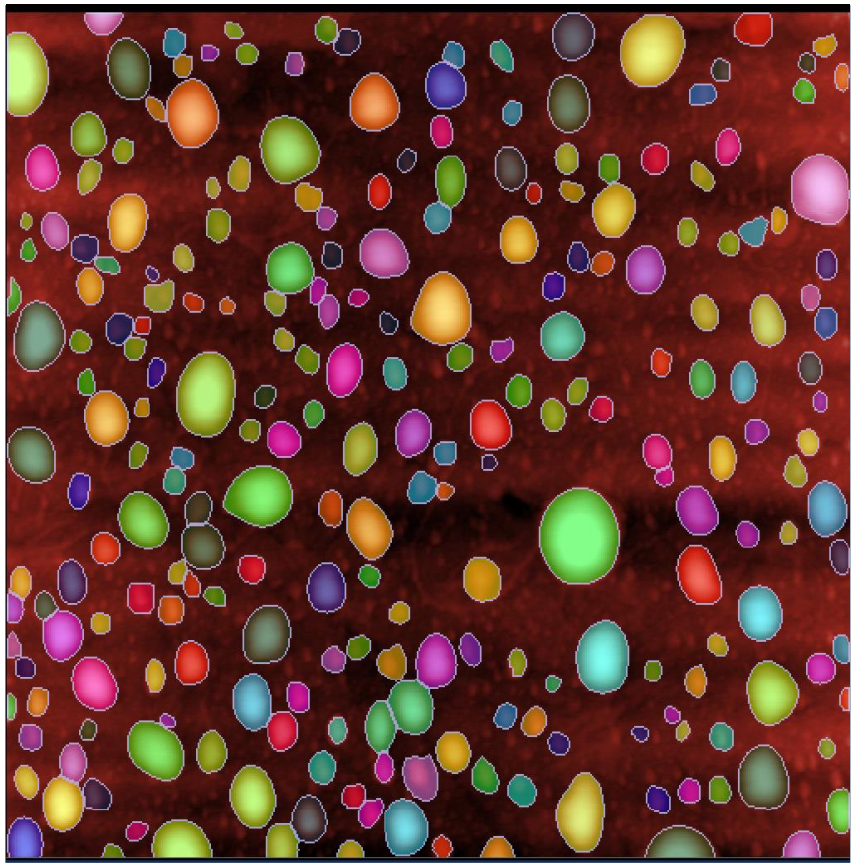
Gwyddion Mask



Masked %	**22.43**
Mask Height Value (µm)	**24.82**

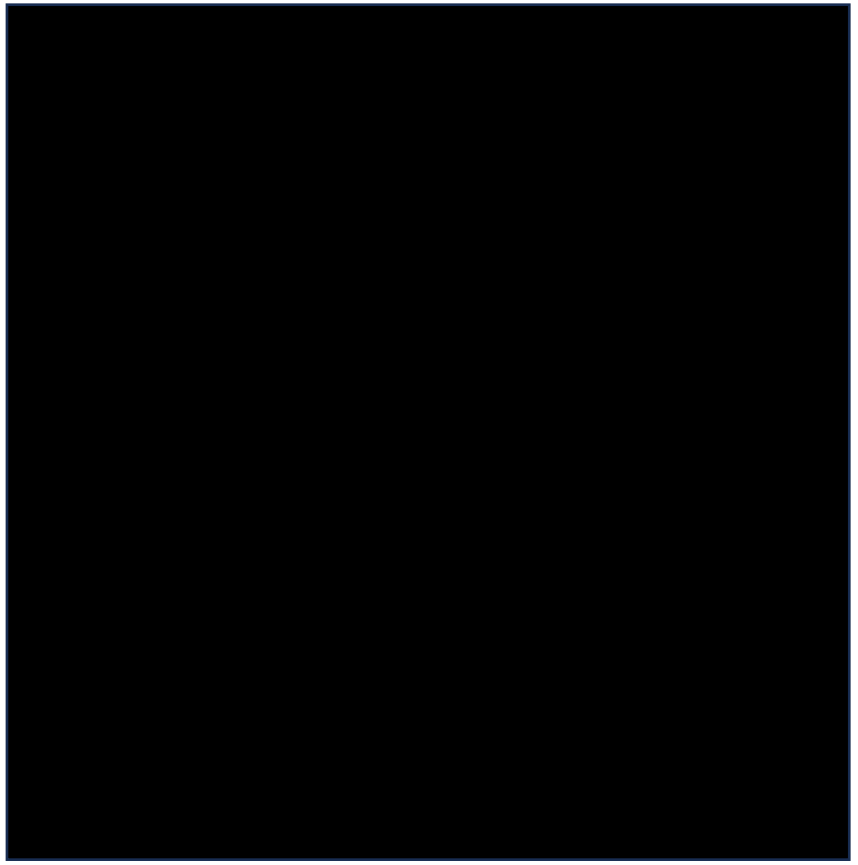
(Г)- 156 – $CHCl_3$ - 23°C – 23°C – 10^{-5}M

Spheres



Area of Spheres = 32.81цm^2

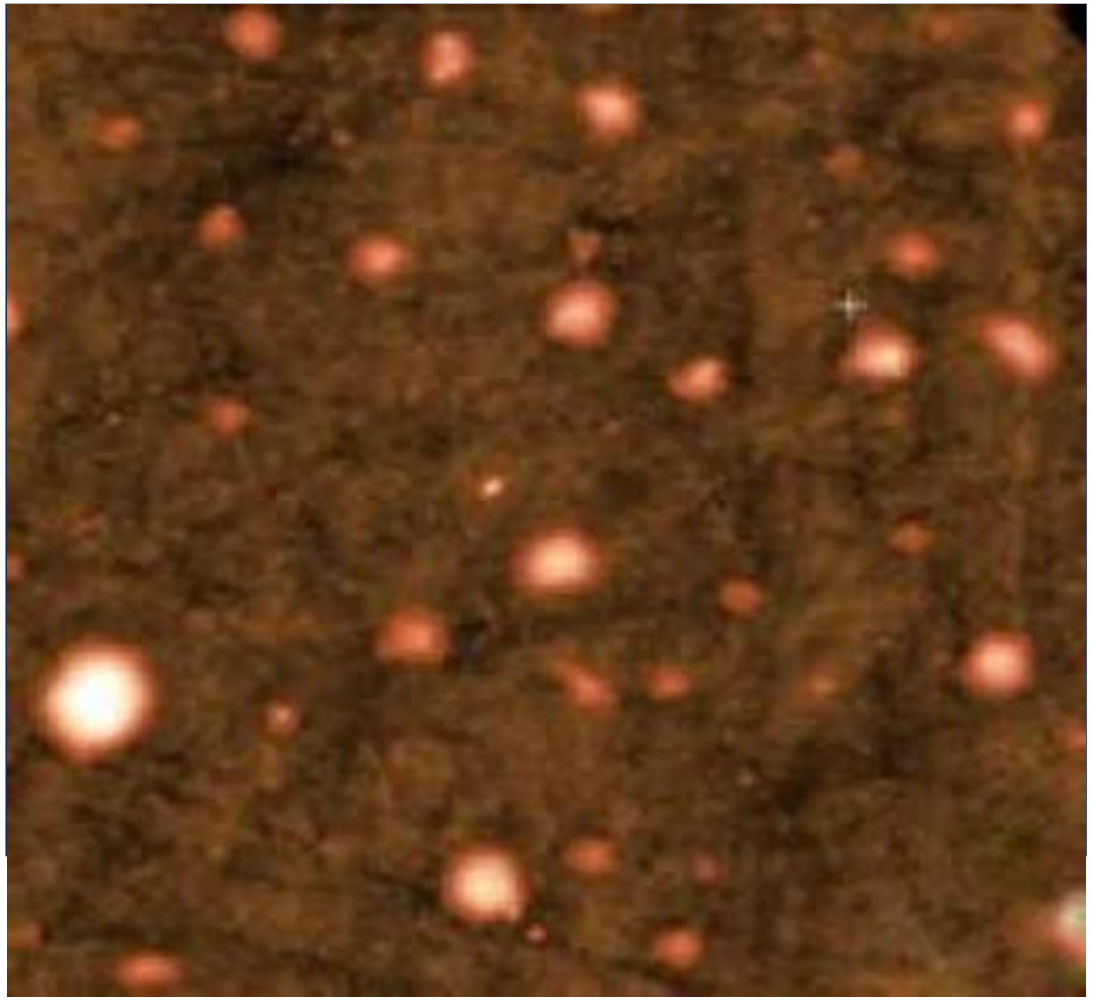
Substance



Area of Substrate = 100цm^2 or area of full substrate/spheres

(Д)- 156 – $CHCl_3$+H_2O - 23°C – 23°C – 10^{-4}M

Original Image

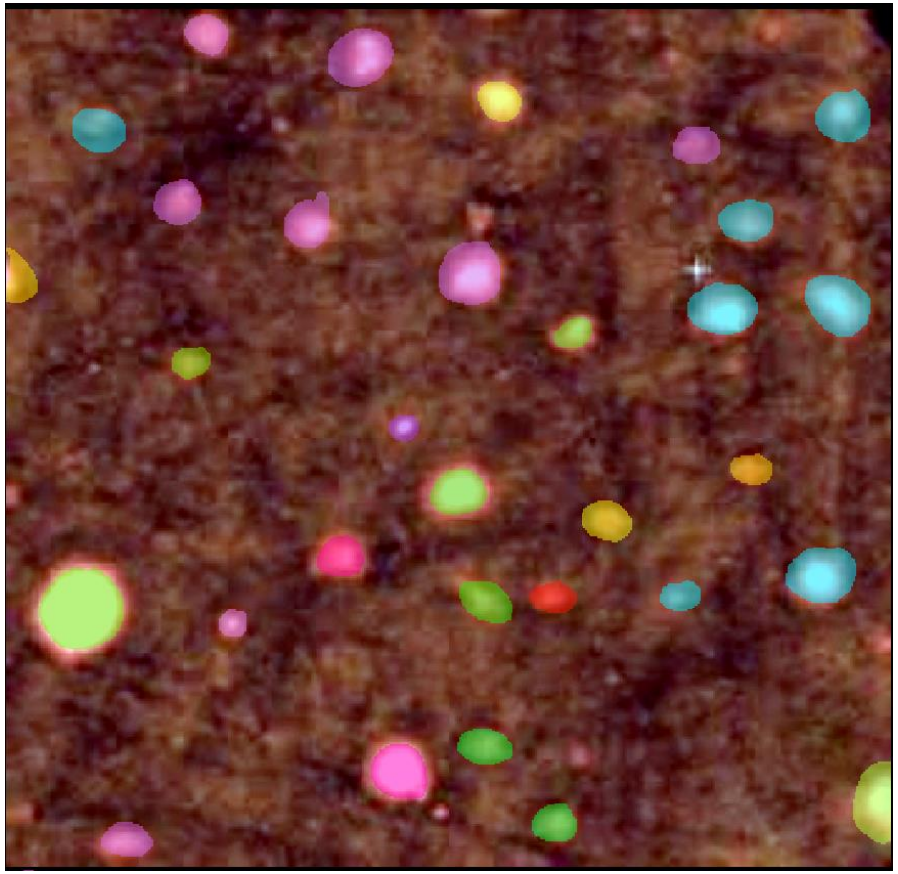


Gwyddion Mask

Masked %	
Mask Height Value (цм)	

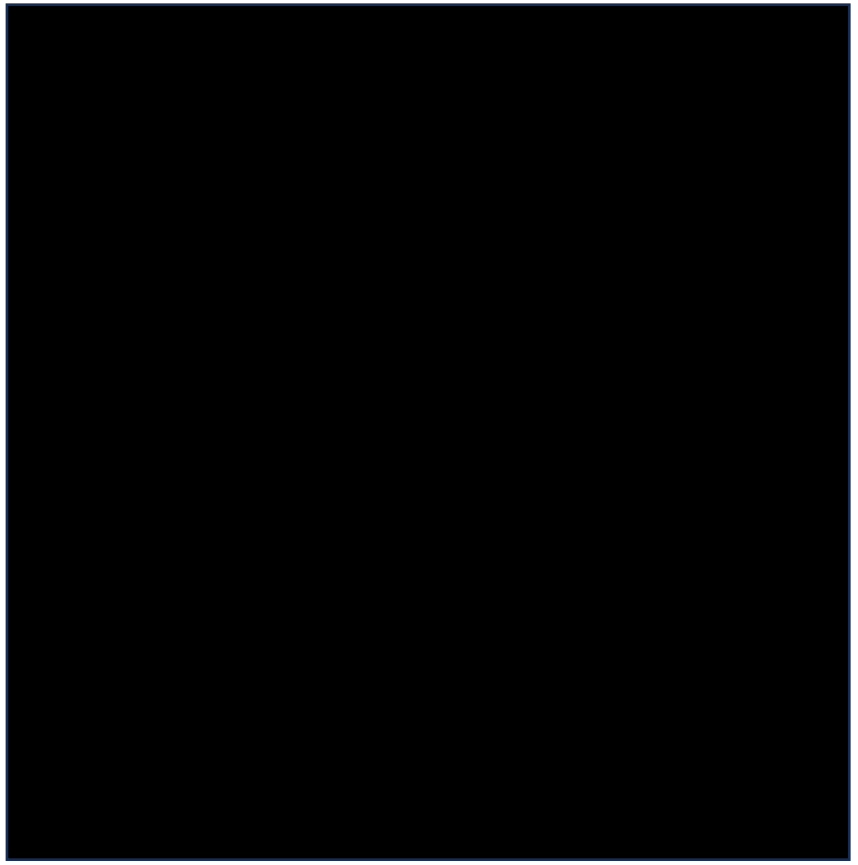
(Д)- 156 – $CHCl_3$+H_2O - 23°C – 23°C – 10^{-4}M

Spheres



Area of Spheres = 7.42цм^2

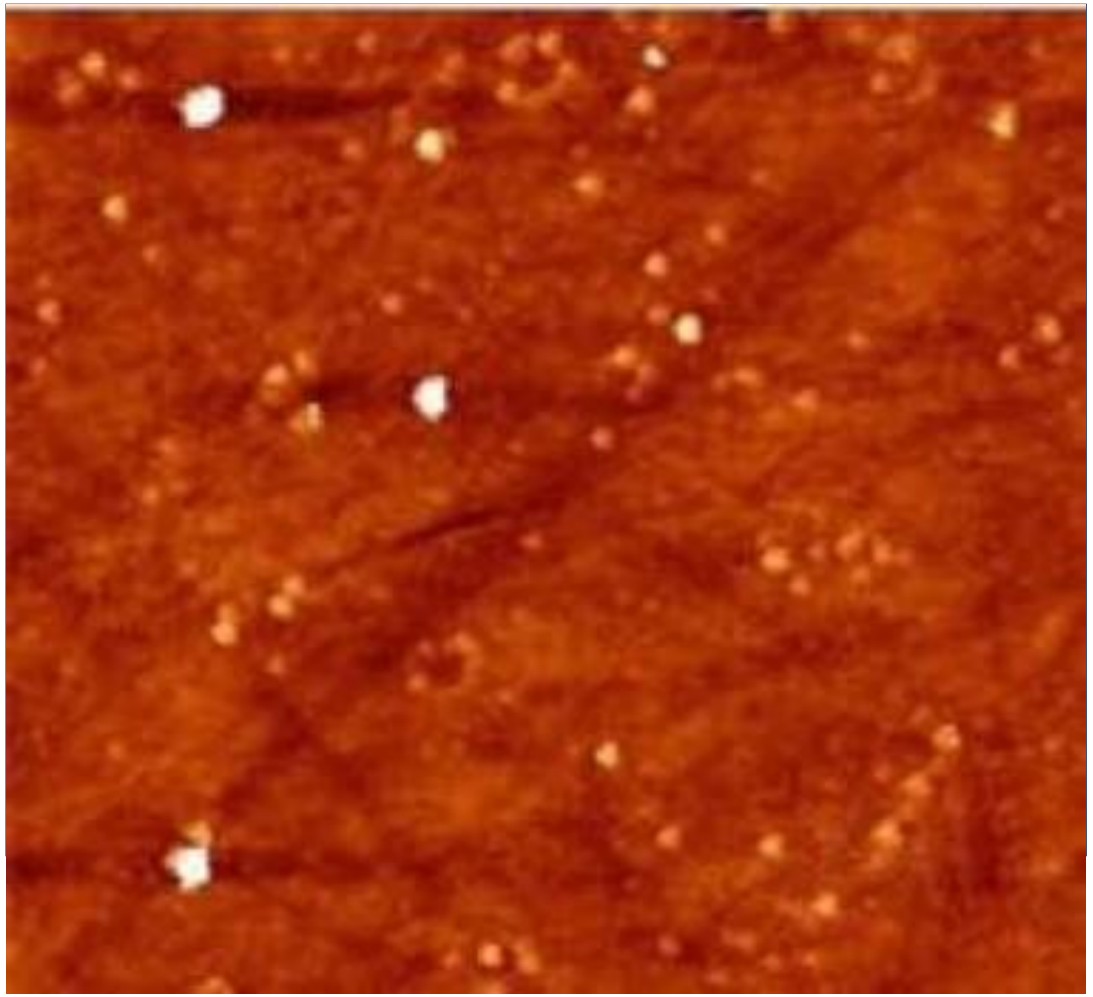
Substance



Area of Substrate = 100цм^2 or area of full substrate/spheres

(E)- 156 – $CHCl_3$+H_2O - 23°C – 23°C – 10^{-5}M

Original Image

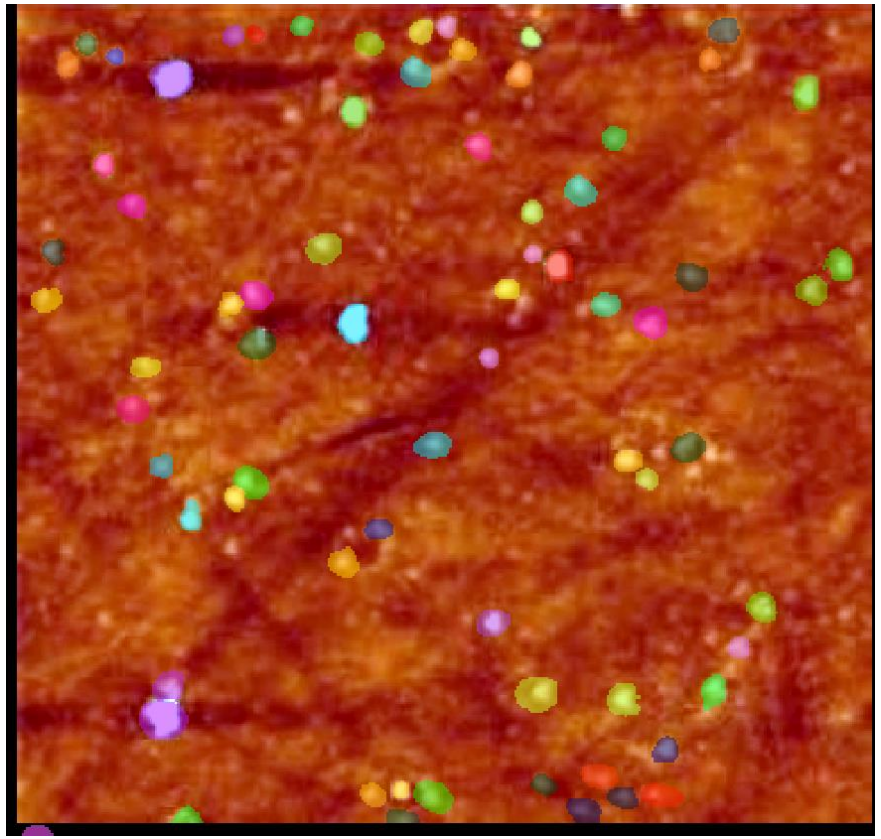


Gwyddion Mask

Masked %	
Mask Height Value (µm)	

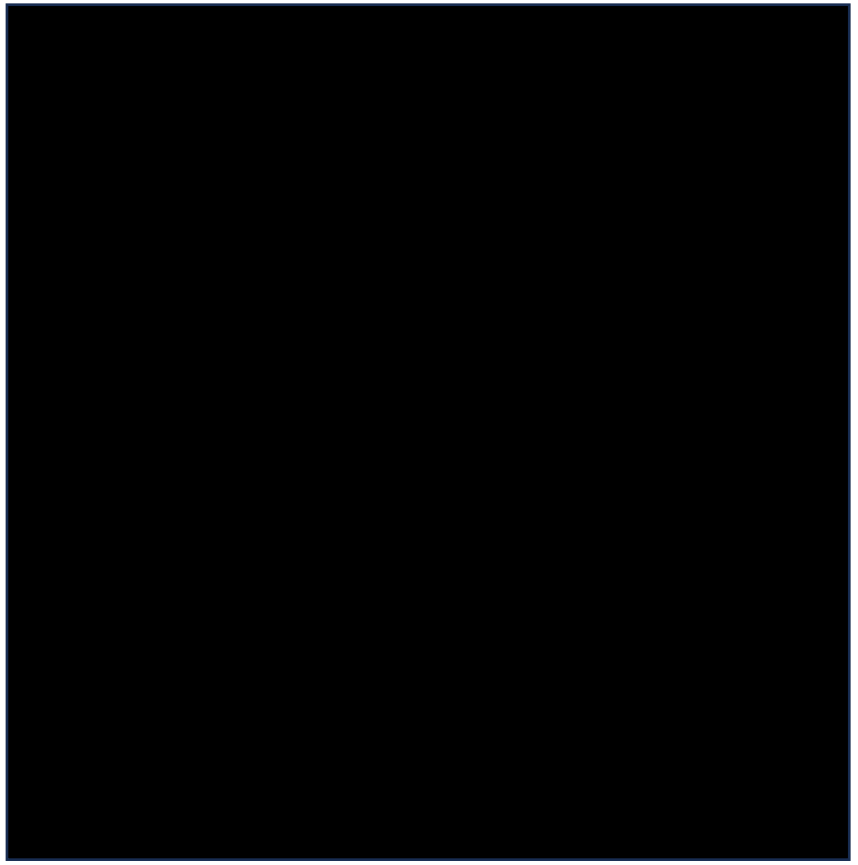
(E)- 156 – $CHCl_3$+H_2O - 23°C – 23°C – 10^{-5}M

Spheres



Area of Spheres = 3.34цm^2

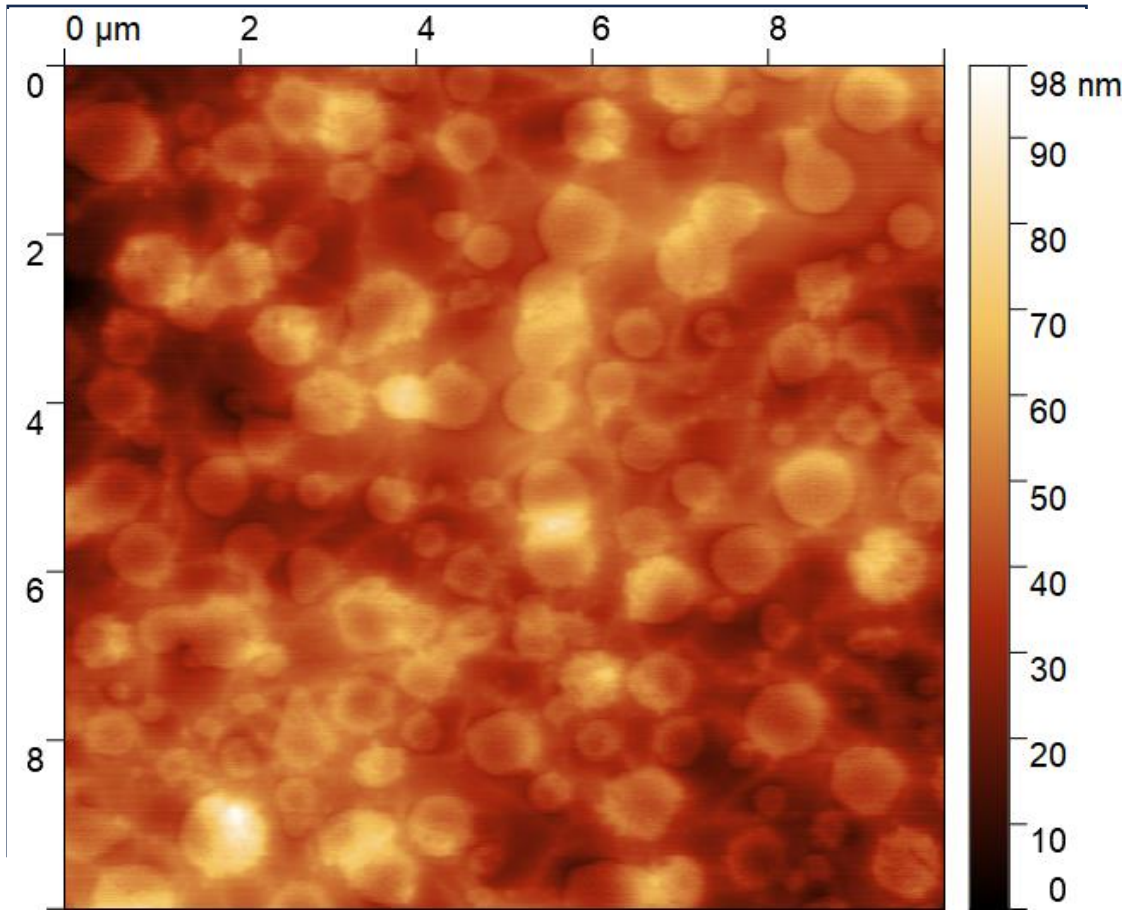
Substance



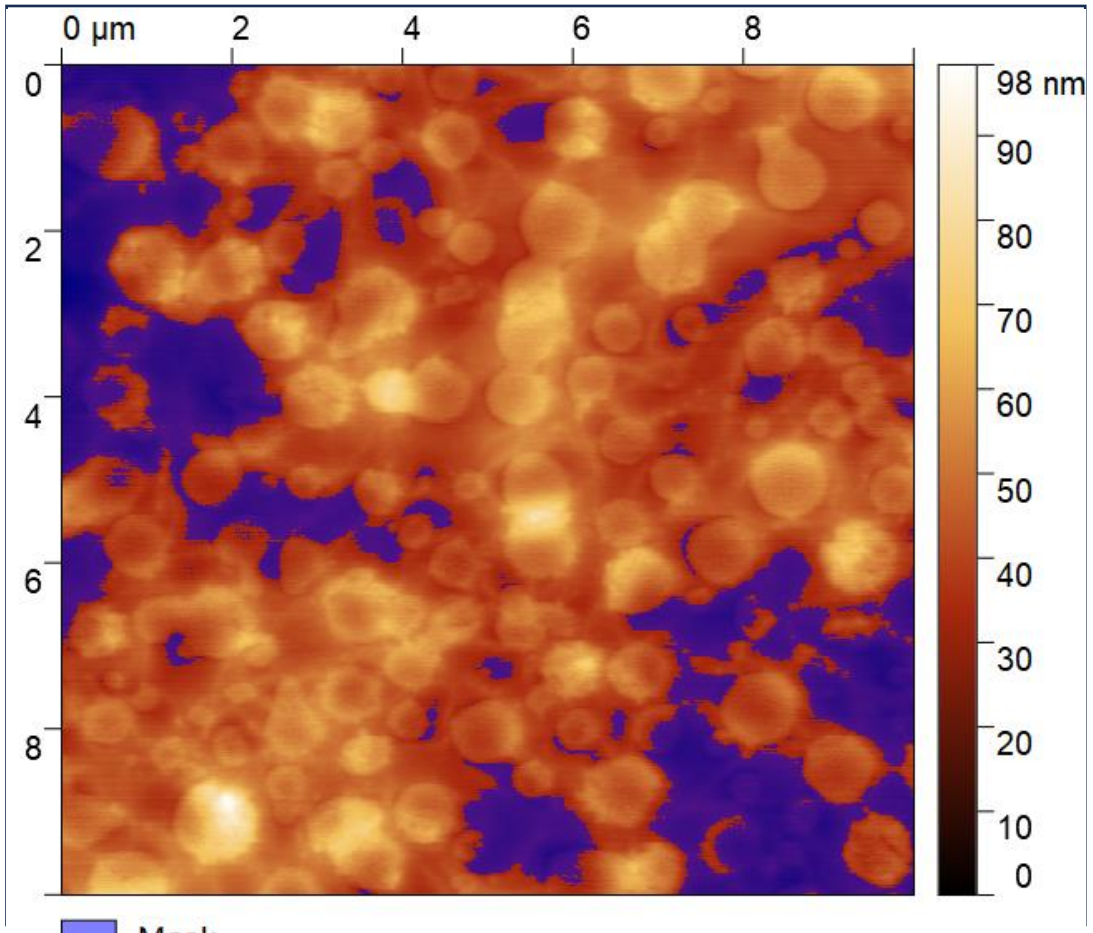
Area of Substrate = 100цm^2 or area of full substrate/spheres

(Ж)- 156 – Toluene - 23°C – 4°C – 10^{-4}M

Original Image



Gwyddion Mask



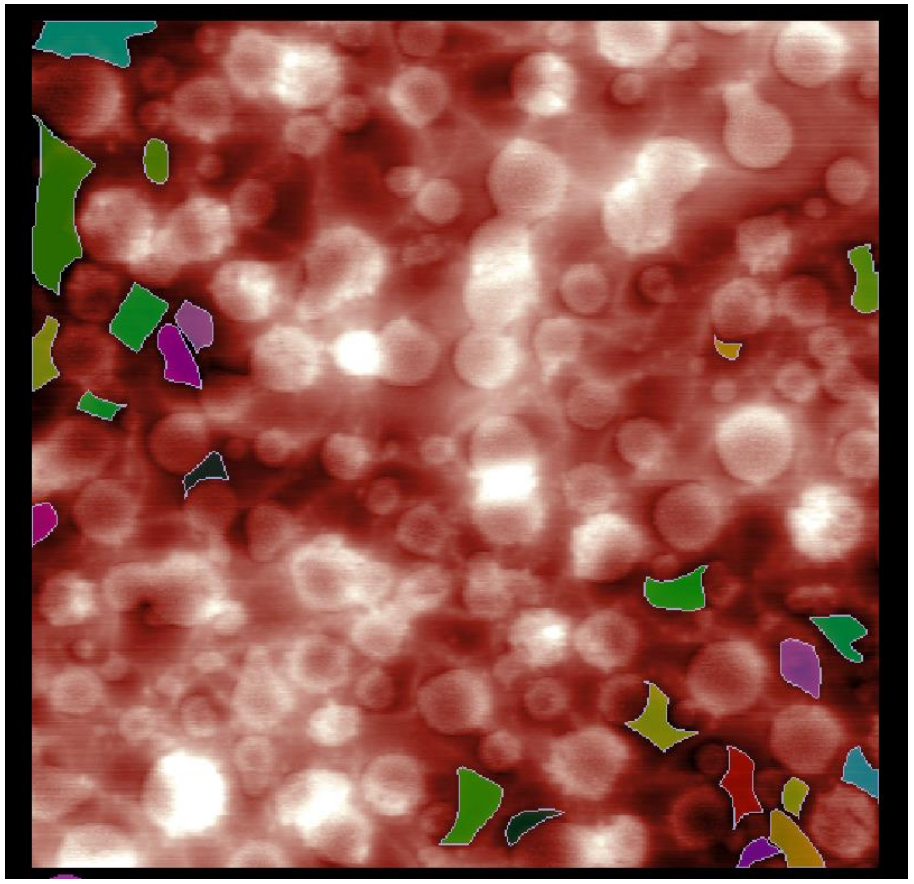
Masked %	**32.71**
Mask Height Value (µm)	**32.150**

(Ж)- 156 – Toluene - 23°C – 4°C – 10^{-4}M

Spheres

Area of Spheres = 45.1цm^2

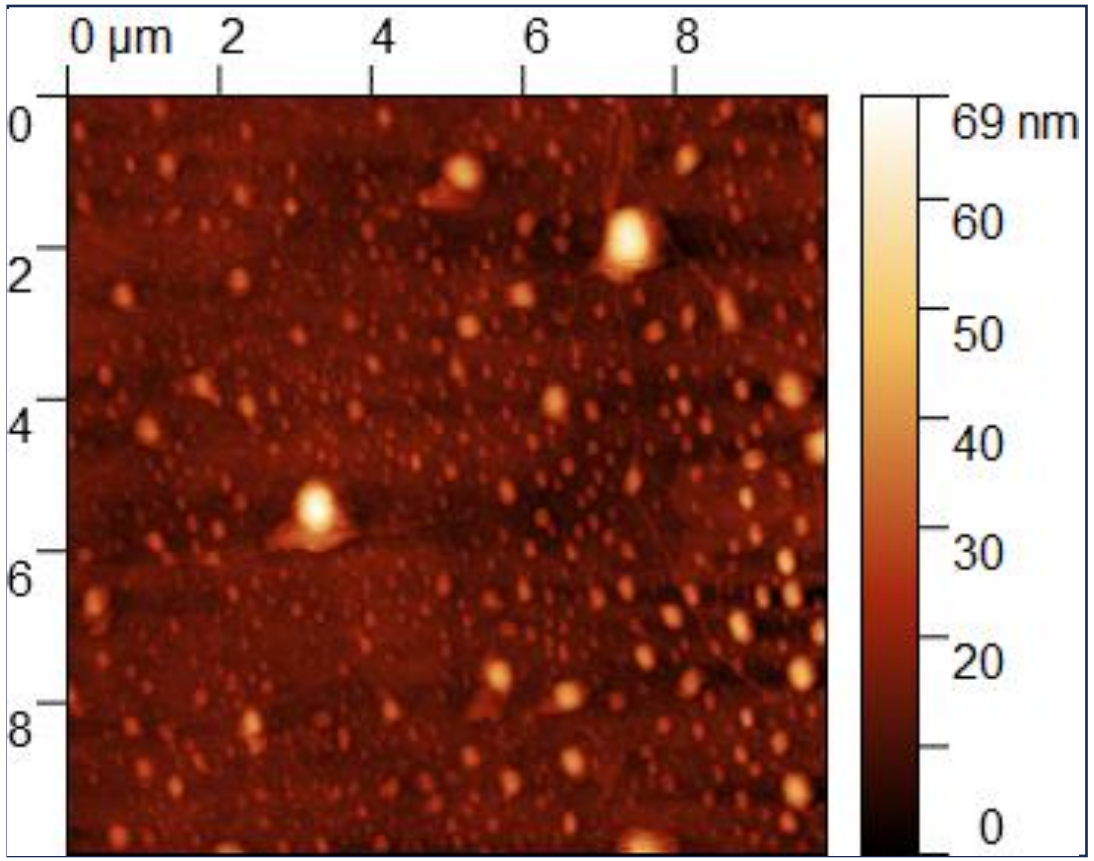
Substance



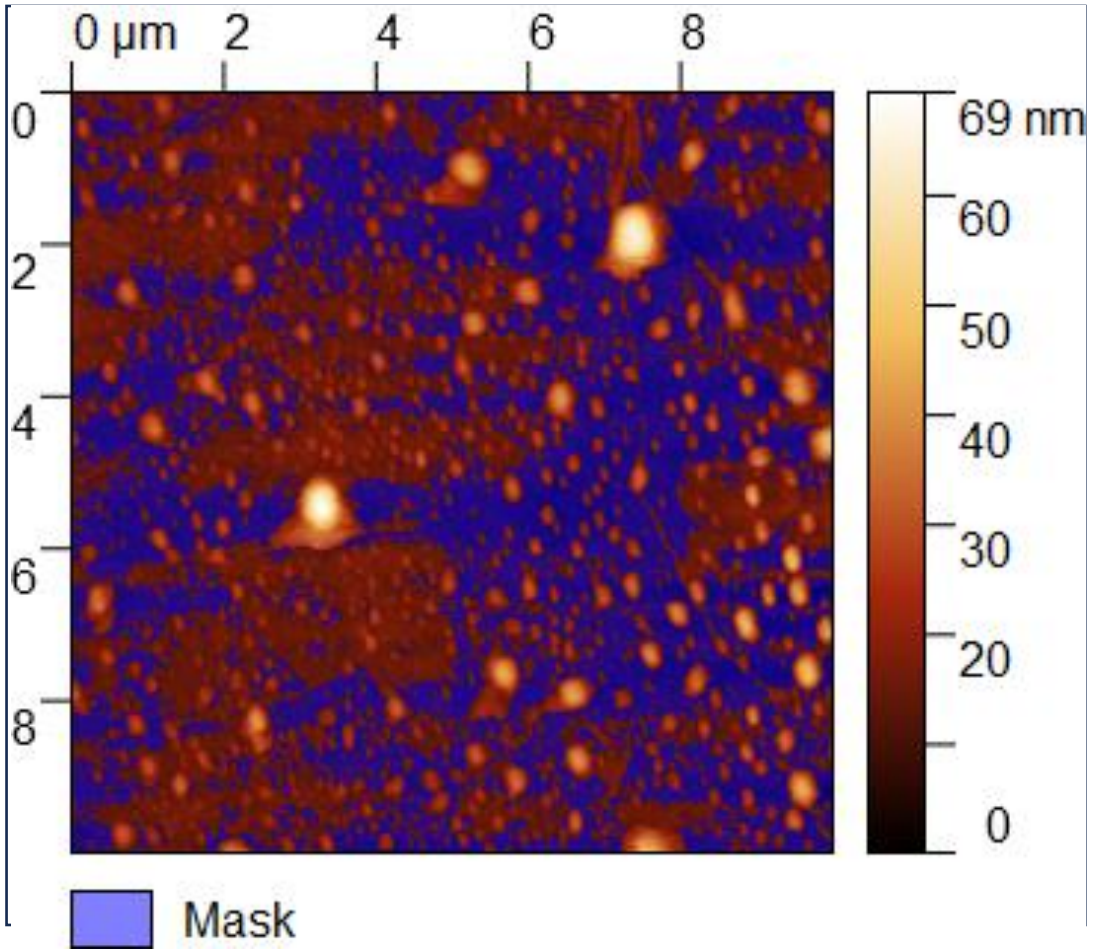
Area of Substrate = 5.46цm^2

(3)- 156 – Toluene - 23°C – 23°C – 10^{-5}M

Original Image



Gwyddion Mask

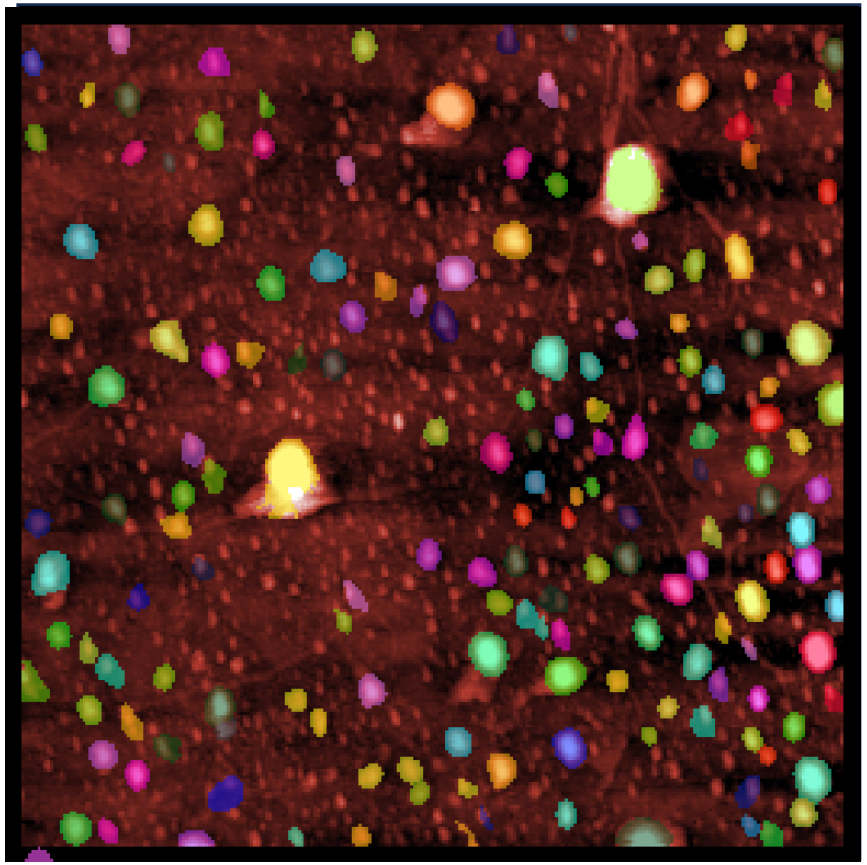


In this sample, I have applied **Polynomial Plan Levelling with degree = 2**

Masked %	**18.71**
Mask Height Value (µm)	**12.962**

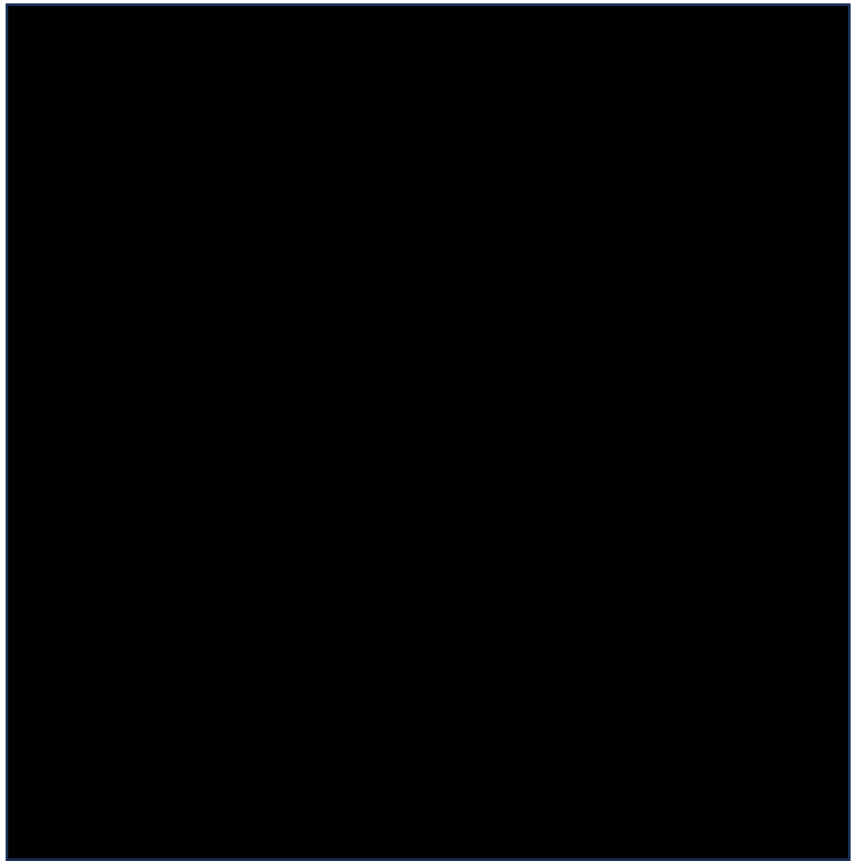
(3)- 156 – Toluene - 23°C – 23°C – 10^{-5}M

Spheres



Area of Spheres = 3.91цm^2

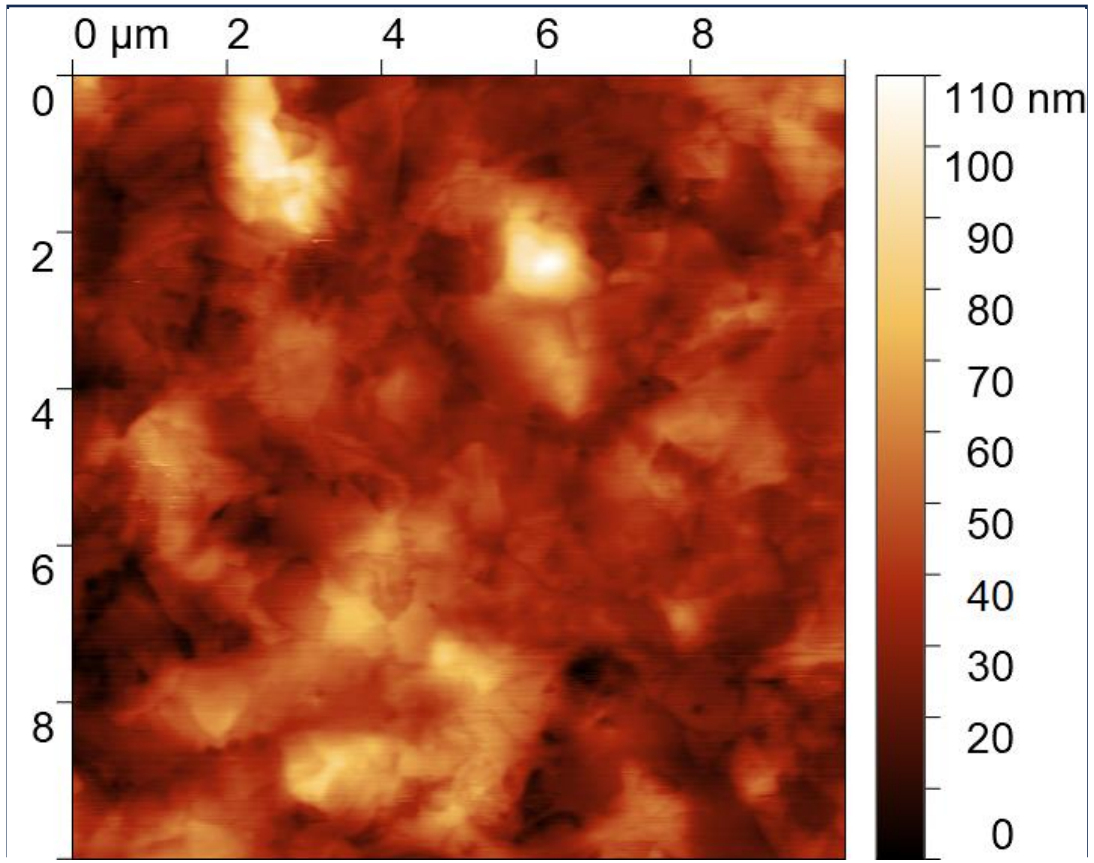
Substance



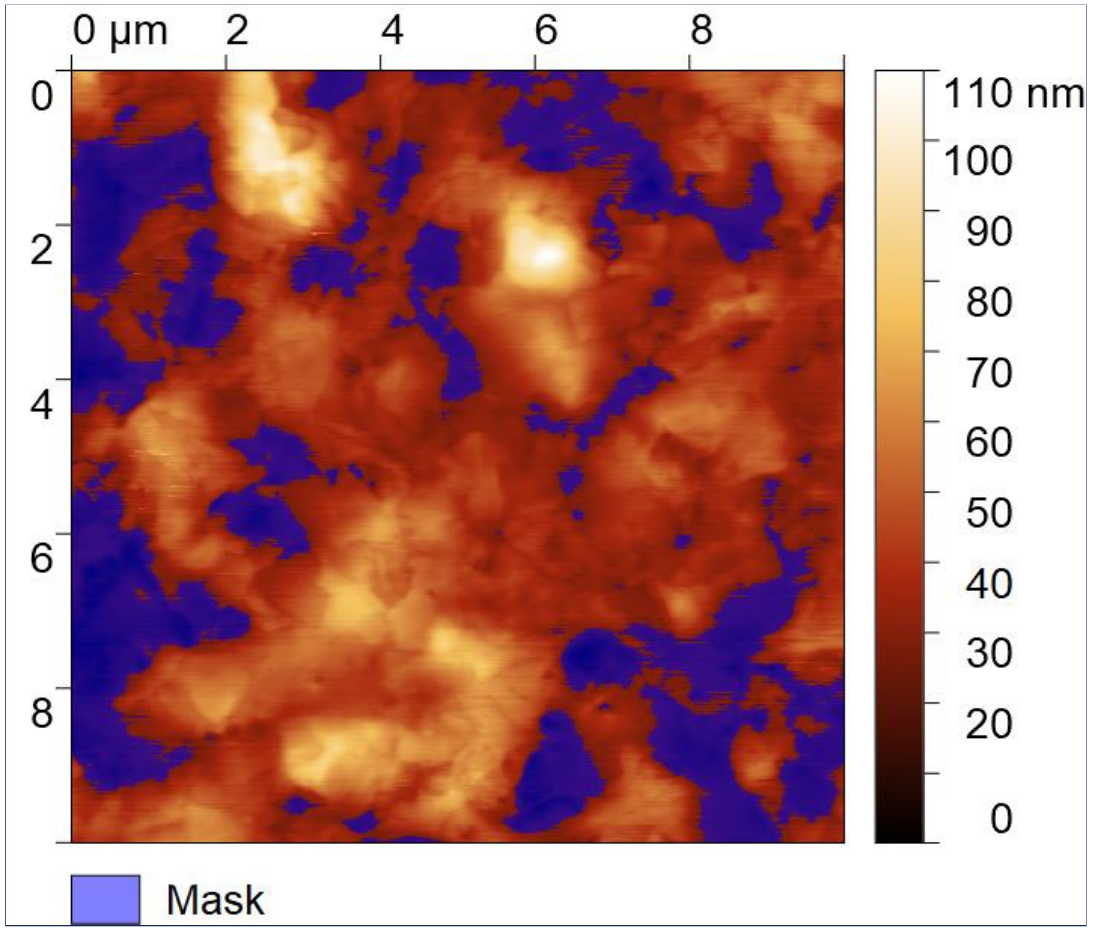
Area of Substrate = 100цm^2 or area of full substrate/spheres

(И)- 159 – $CHCl_3$ - 23°C – 23°C – 10^{-4}M

Original Image



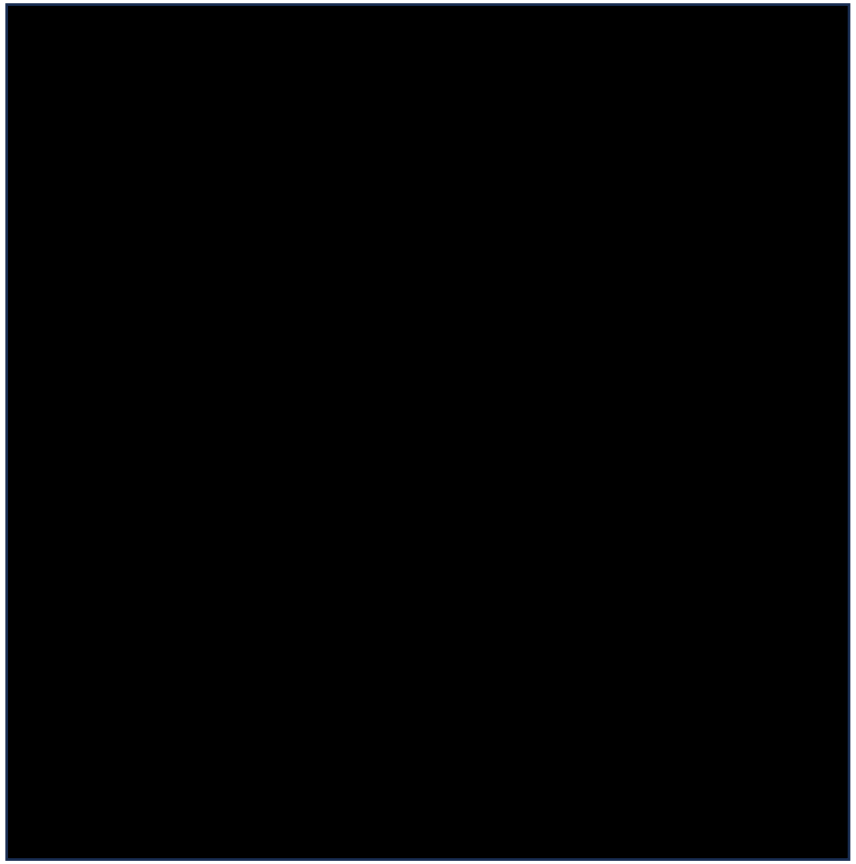
Gwyddion Mask



Masked %	**24.30**
Mask Height Value (µm)	**26.69**

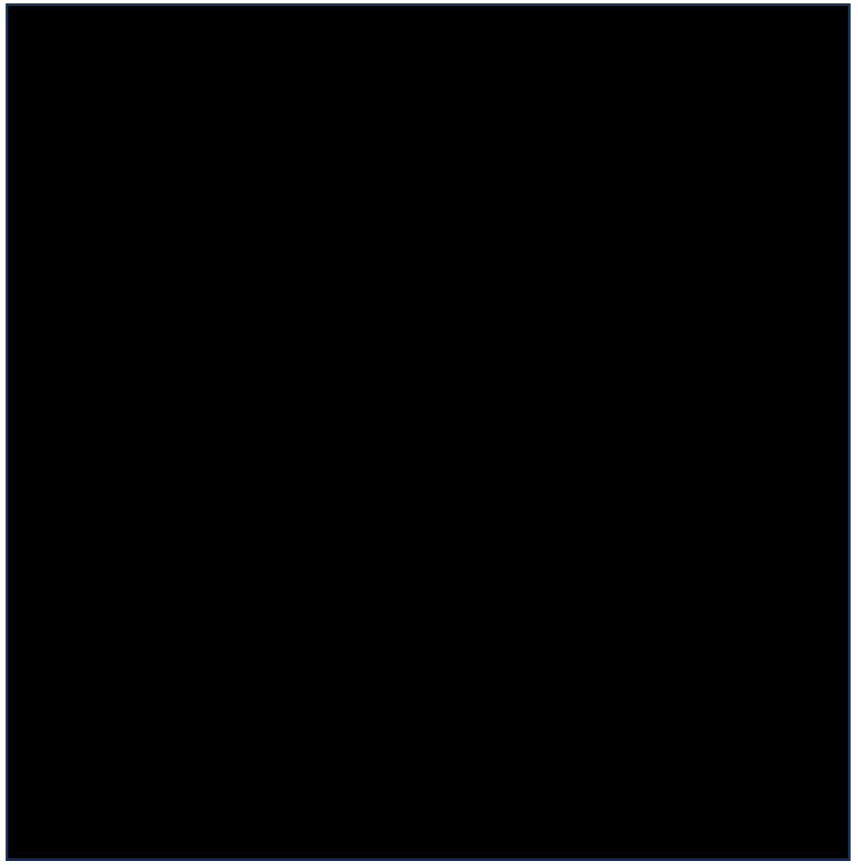
(И)- 159 – $CHCl_3$ - 23°C – 23°C – 10^{-4}M

Spheres



Area of Spheres = 0цм^2

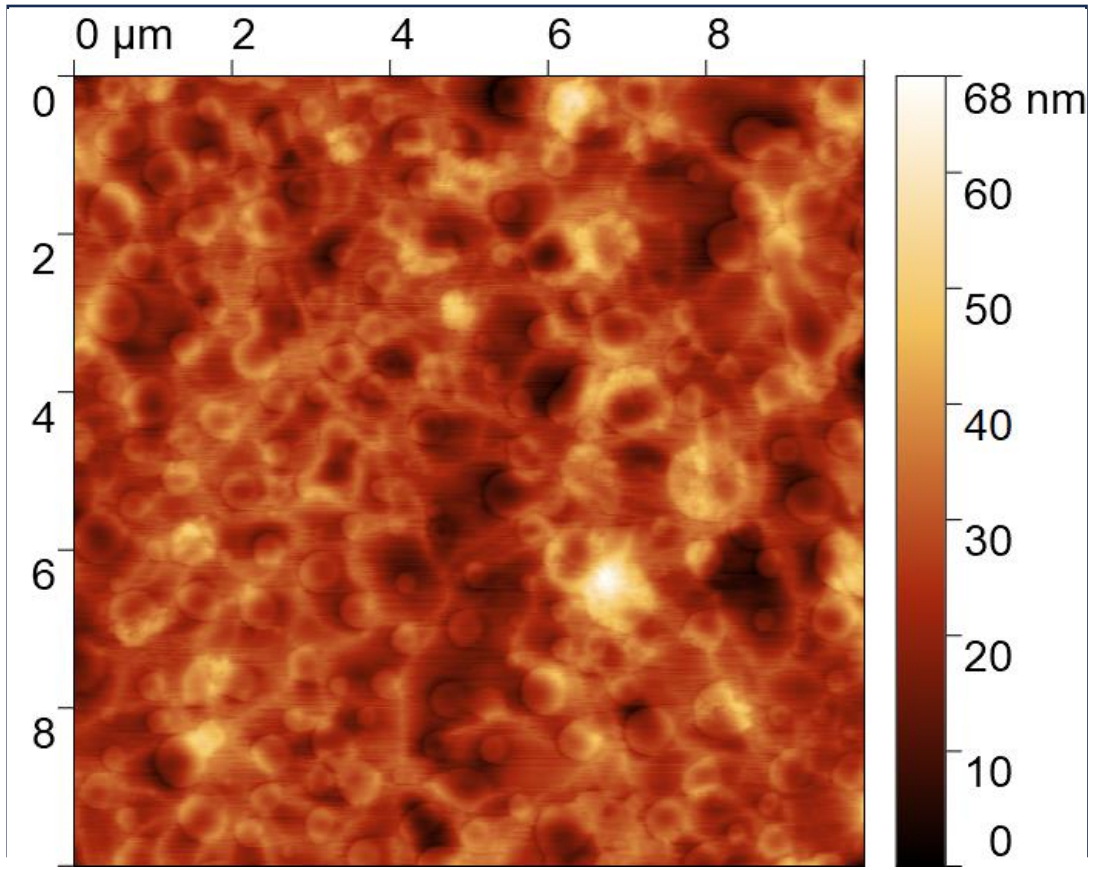
Substance



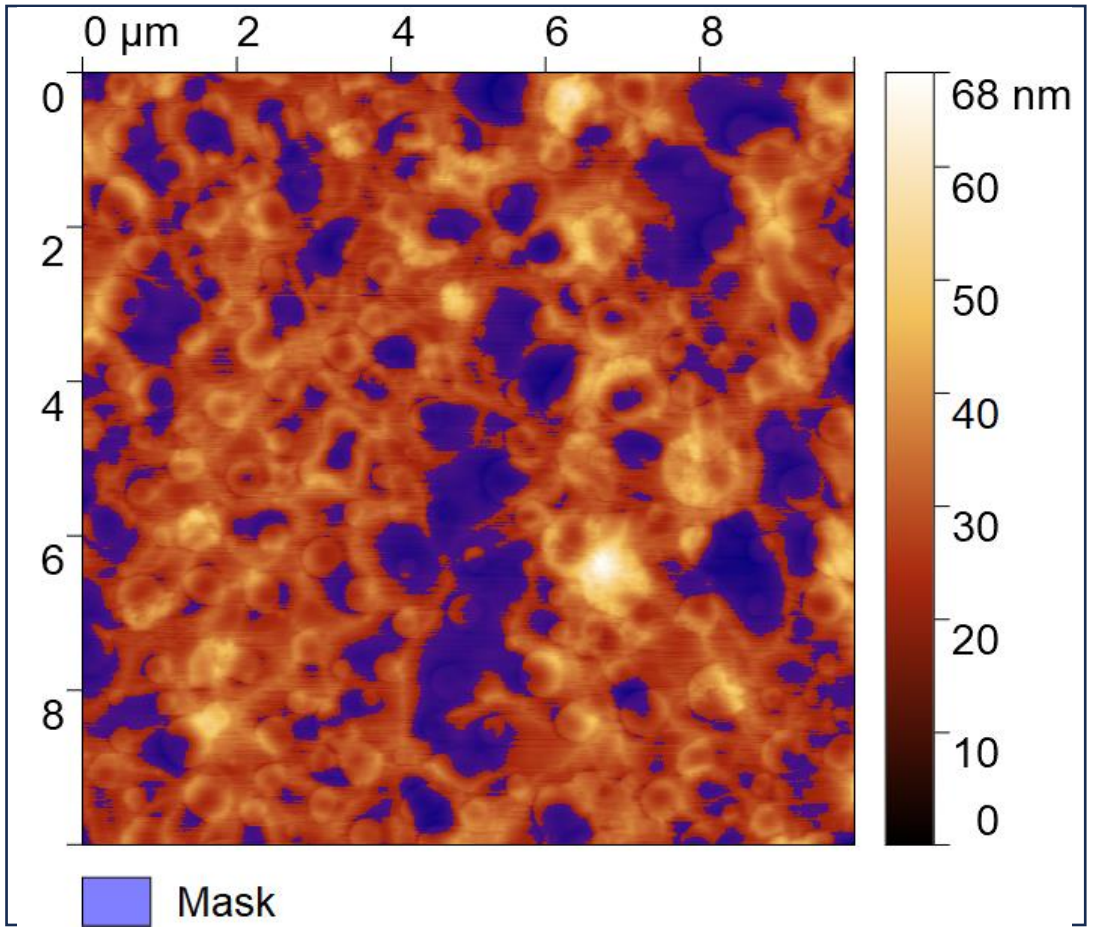
Area of Substrate = 100цм^2 or area of full substrate/spheres

(K)- 159 – $CHCl_3$ - 23°C – 23°C – 10^{-5}M

Original Image



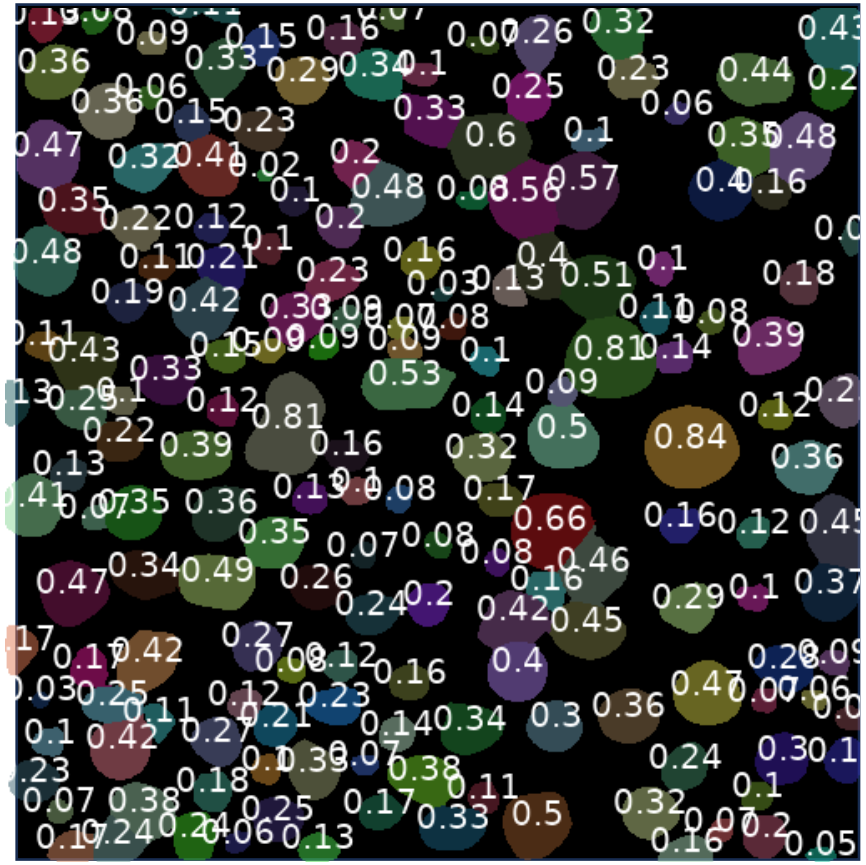
Gwyddion Mask



Masked %	**31.78**
Mask Height Value (µm)	**21.698**

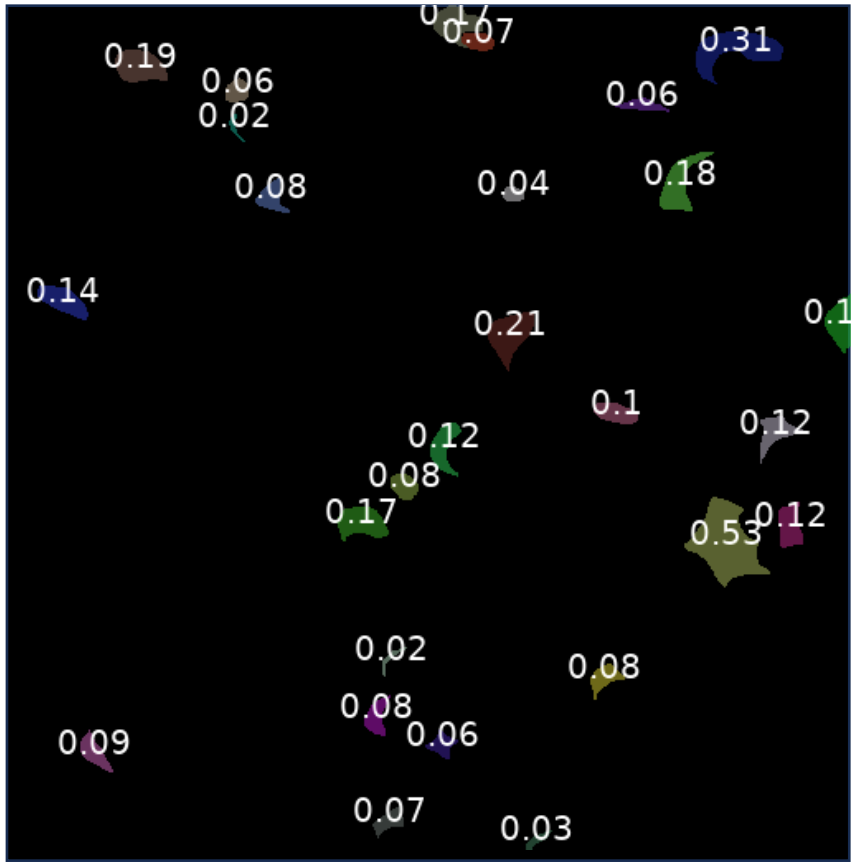
(K)- 159 – $CHCl_3$ - 23°C – 23°C – 10^{-5}M

Spheres



Area of Spheres = 43.23цm^2

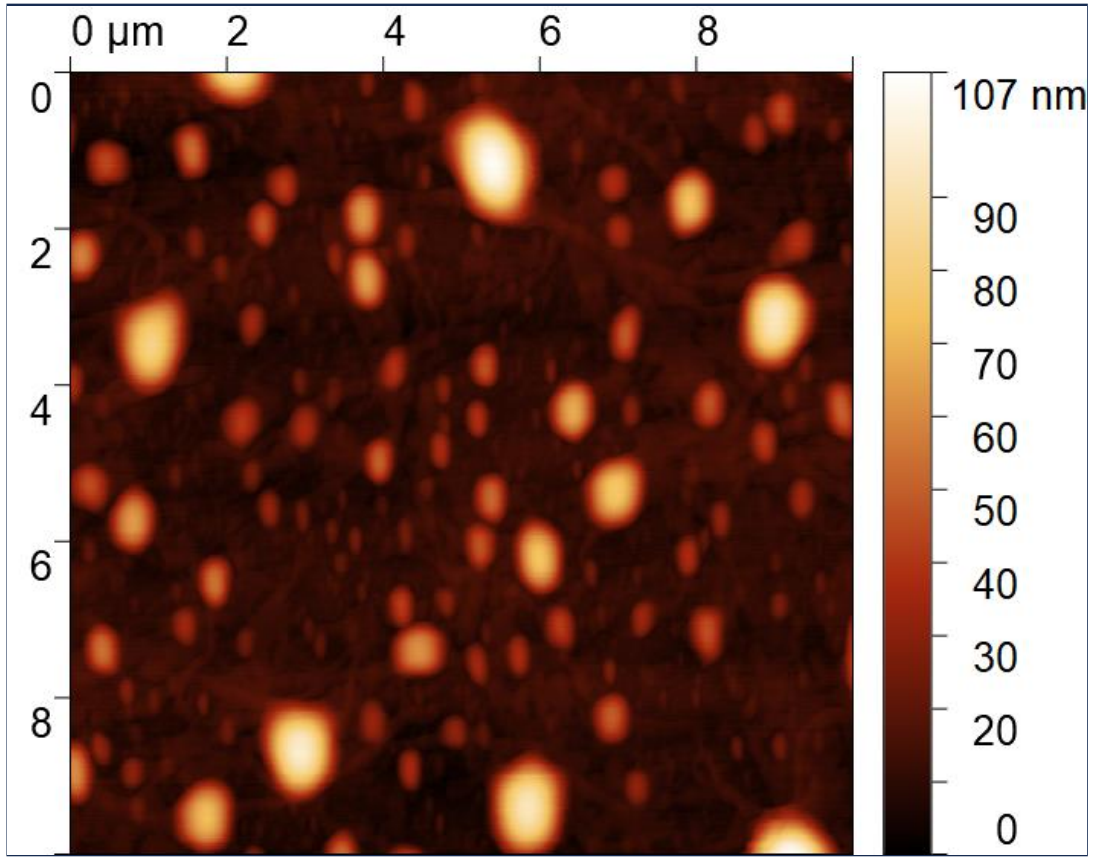
Substance



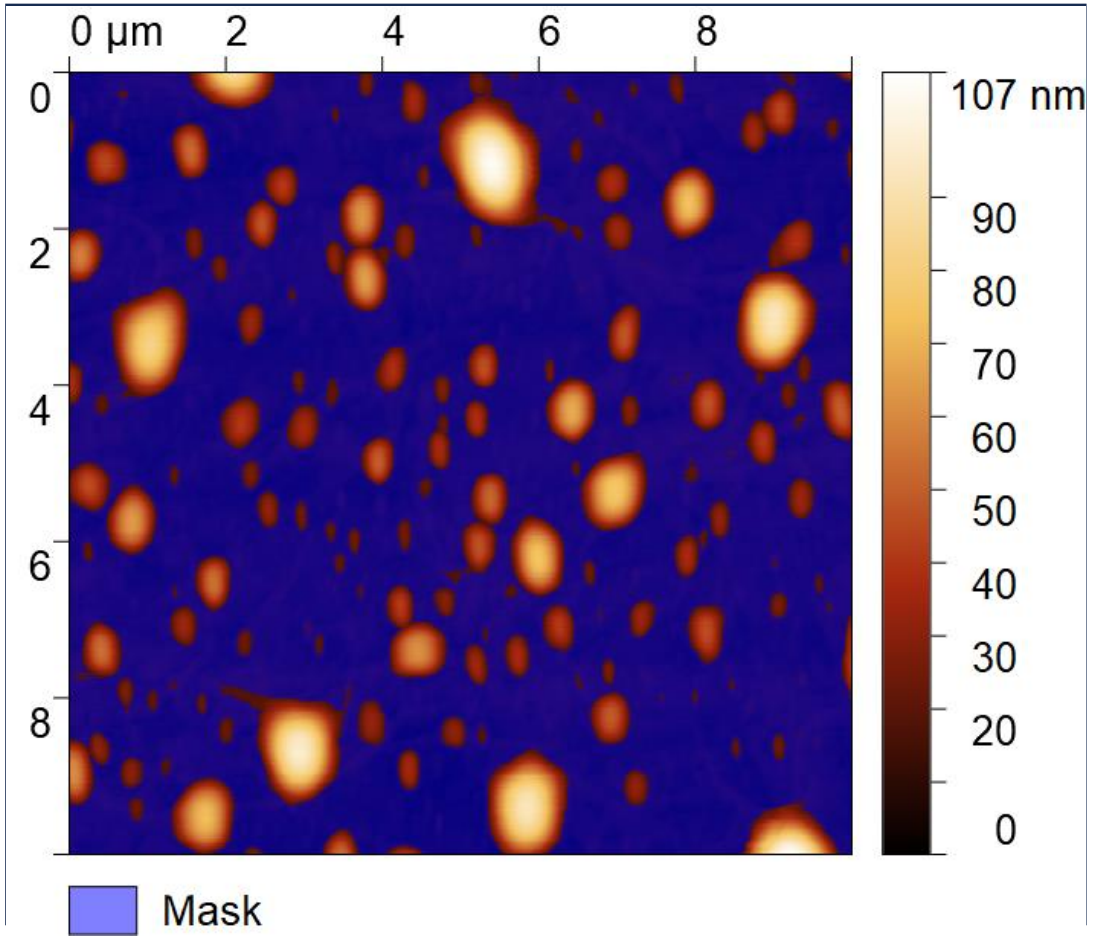
Area of Substrate = 3.34цm^2

(Л)- 159 – Toluene - 23°C – 23°C – 10^{-4}M

Original Image



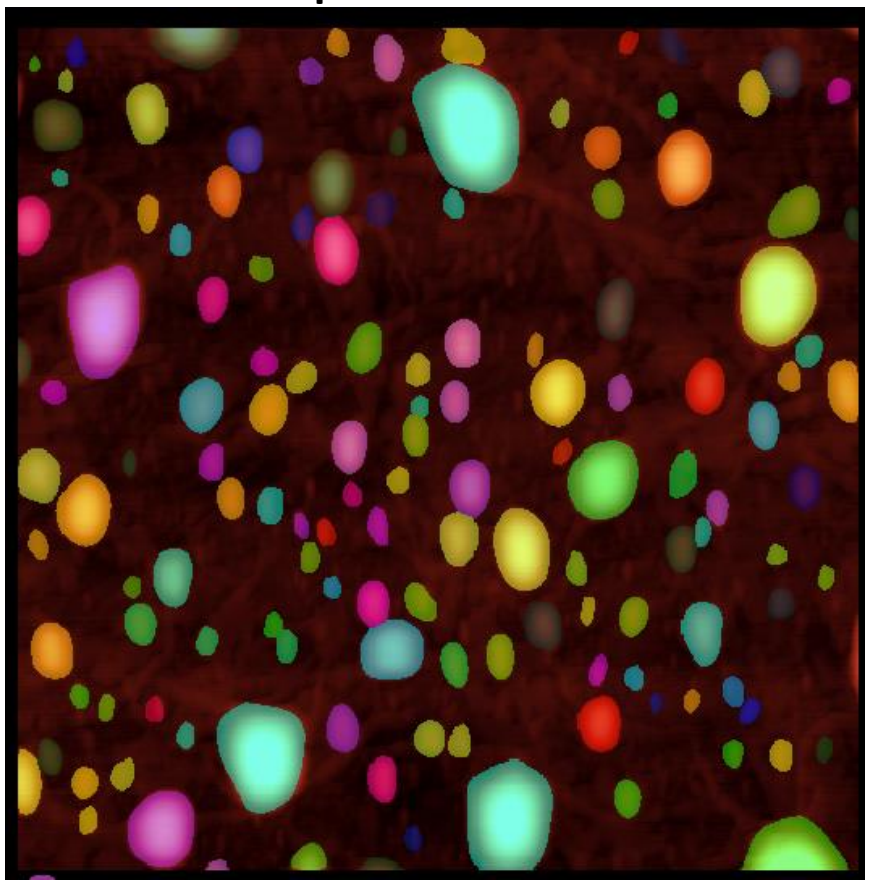
Gwyddion Mask



Masked %	**15.89**
Mask Height Value (µm)	**17.00**

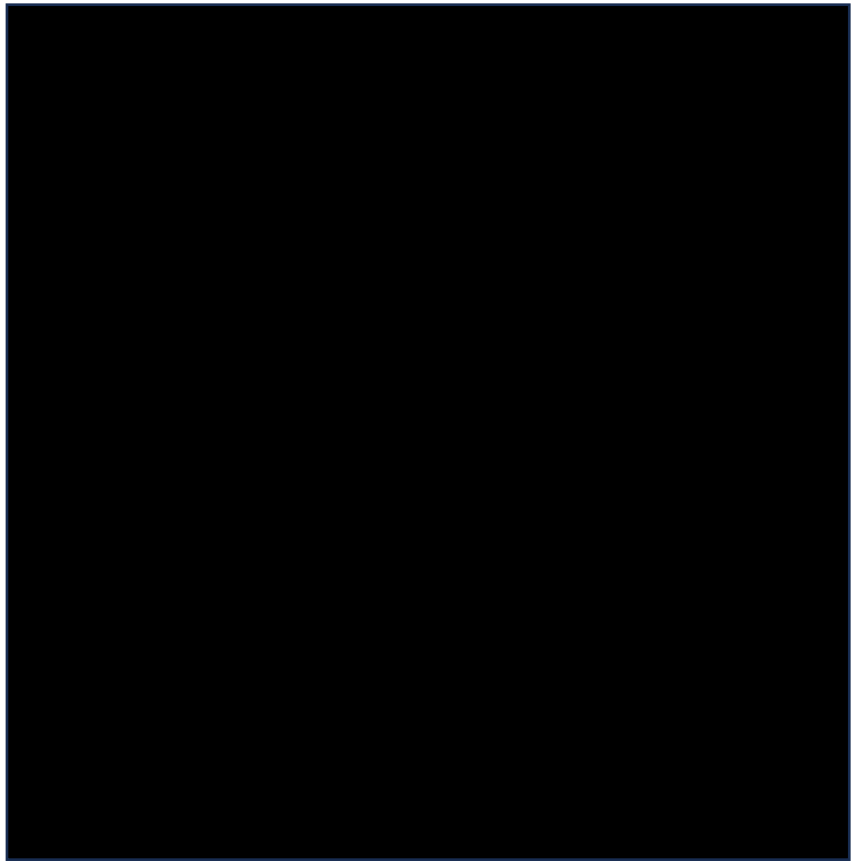
(Л)- 159 – Toluene - 23°C – 23°C – 10^{-4}M

Spheres



Area of Spheres = 24.74цm^2

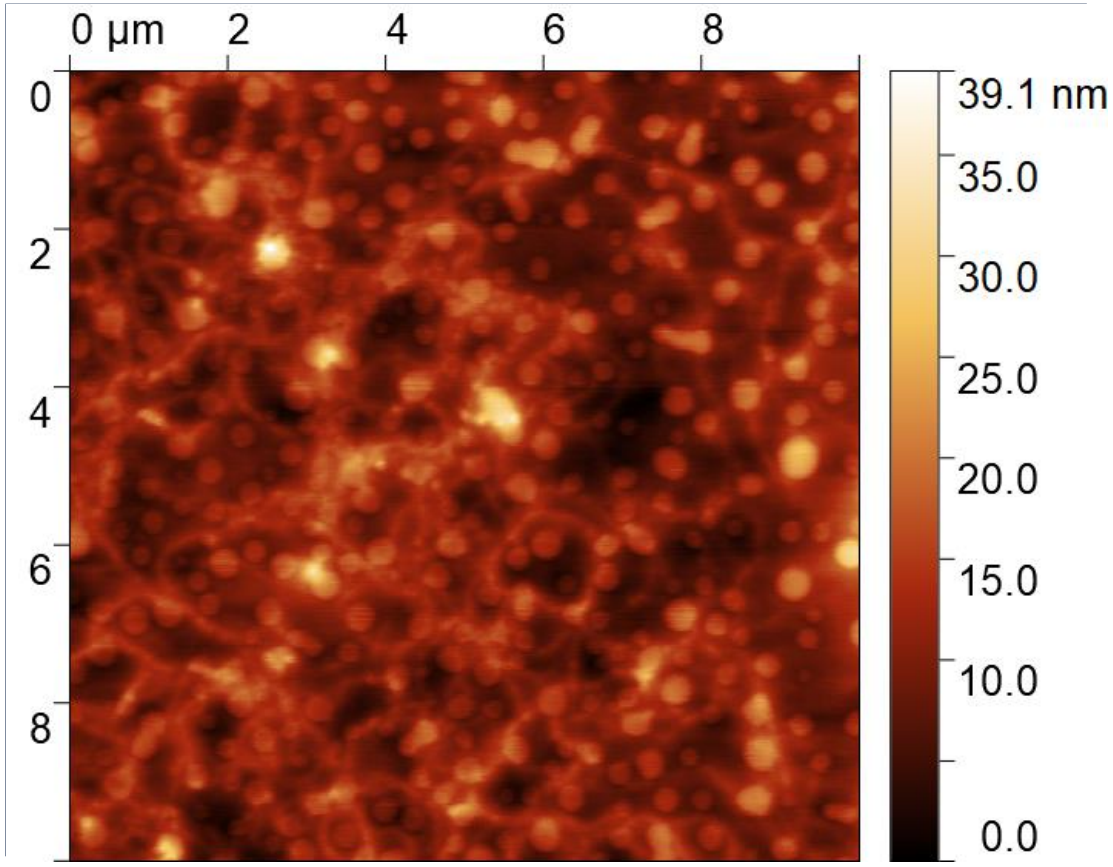
Substance



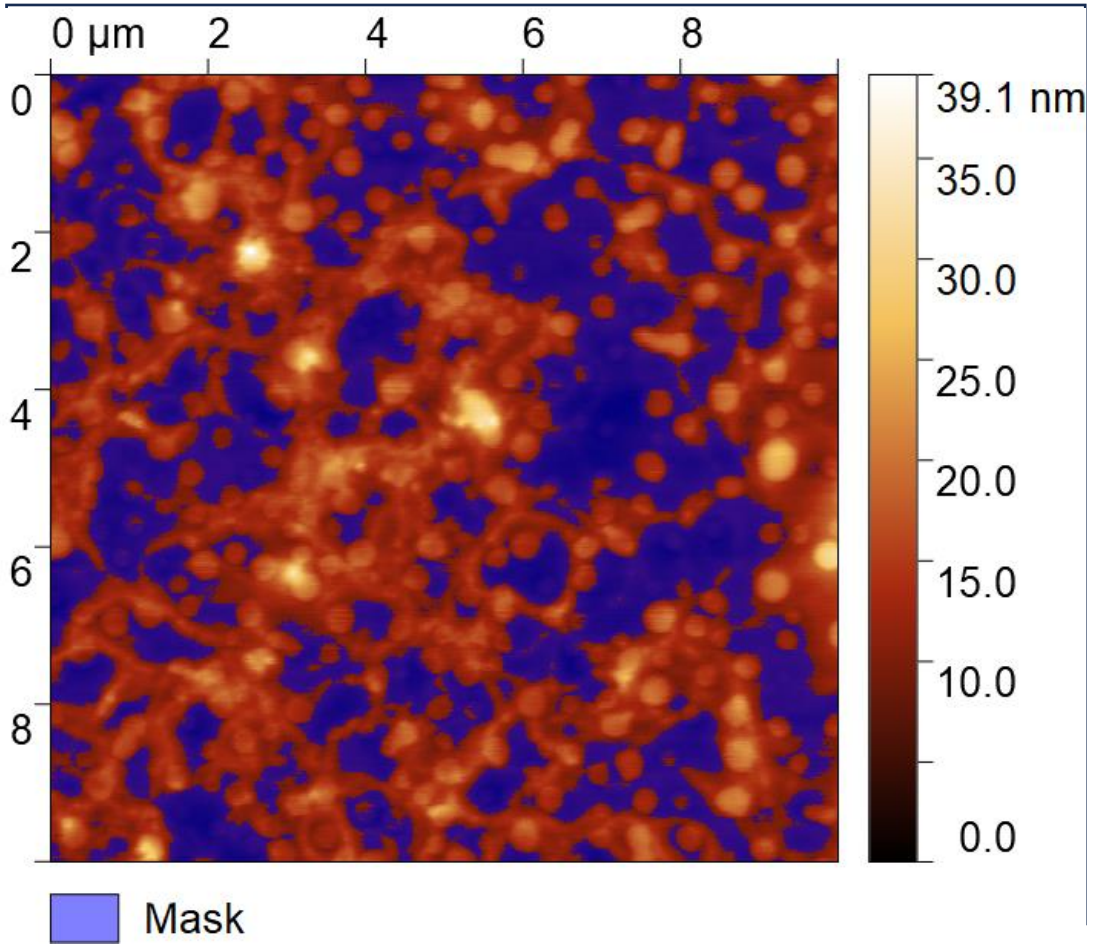
Area of Substrate = 100цm^2 or area of full substrate/spheres

(M)- 159 – Toluene - 23°C – 23°C – 10^{-5}M

Original Image



Gwyddion Mask

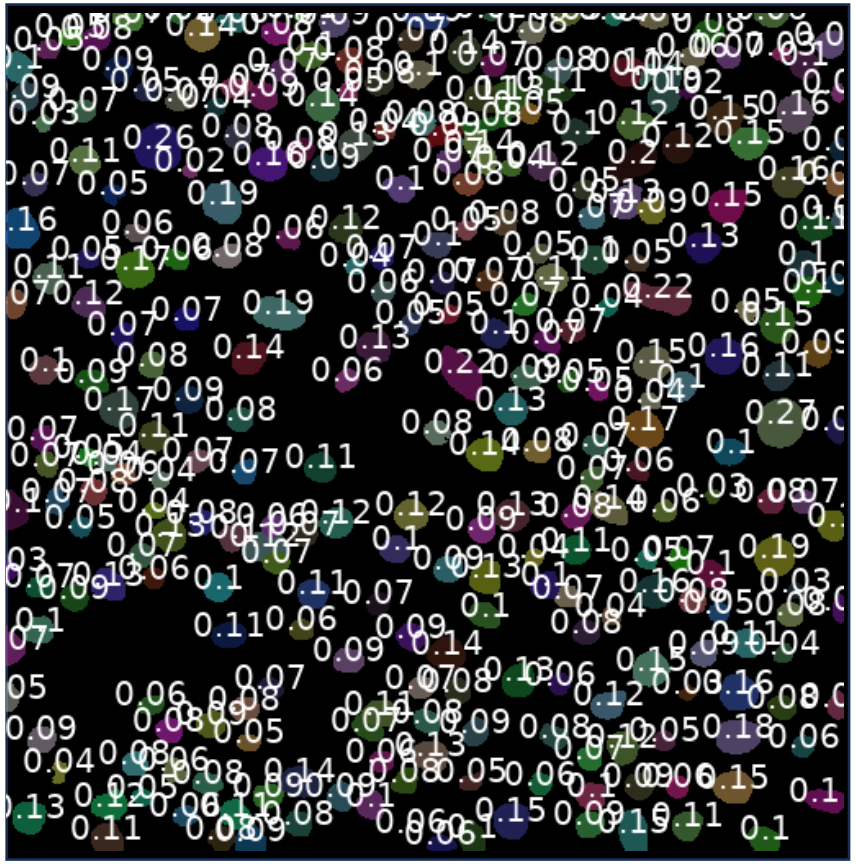


In this sample, I have applied **Polynomial Plan Levelling with degree = 2,** since there are too many horizonal scratches

Masked %	**23.36**
Mask Height Value (µm)	**9.139**

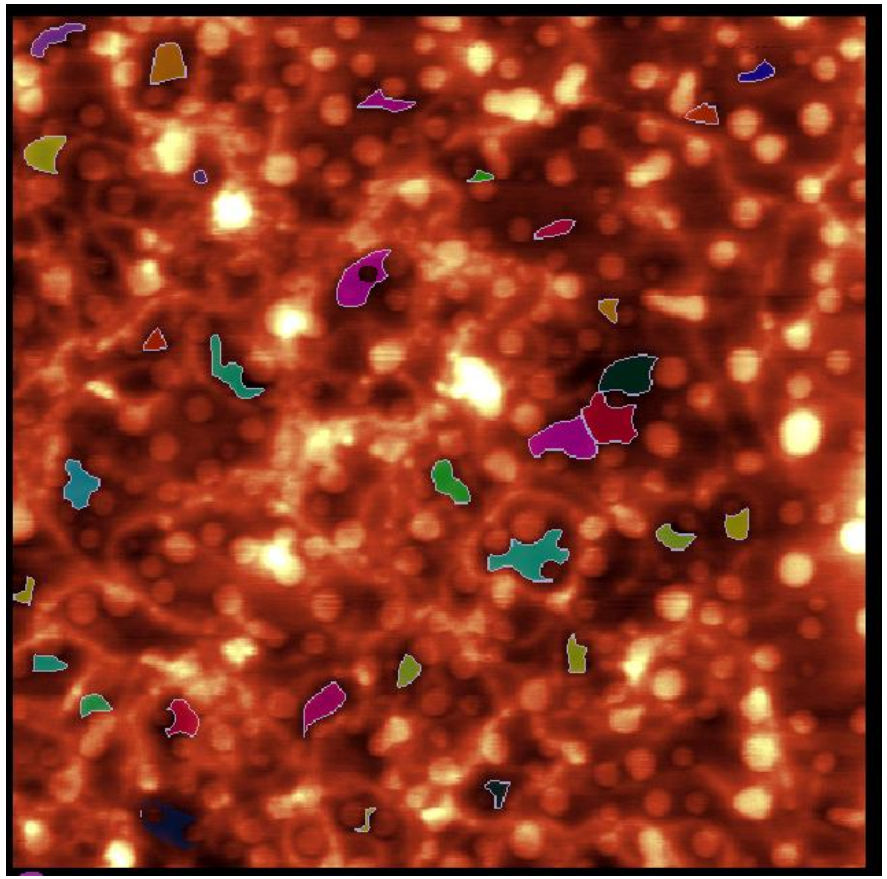
(A)- 156 – $CHCl_3$ - 23°C – 23°C – 10^{-4}M

Spheres



Area of Spheres = 26.29цm^2

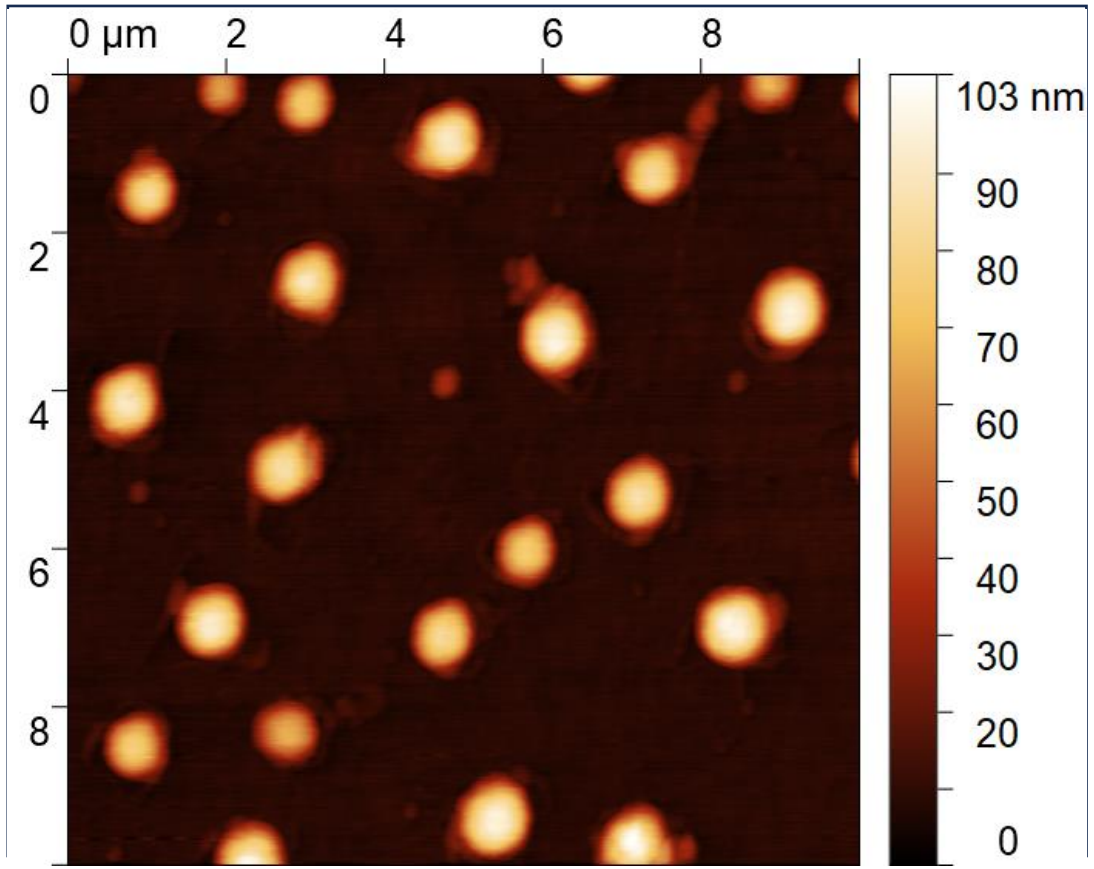
Substance



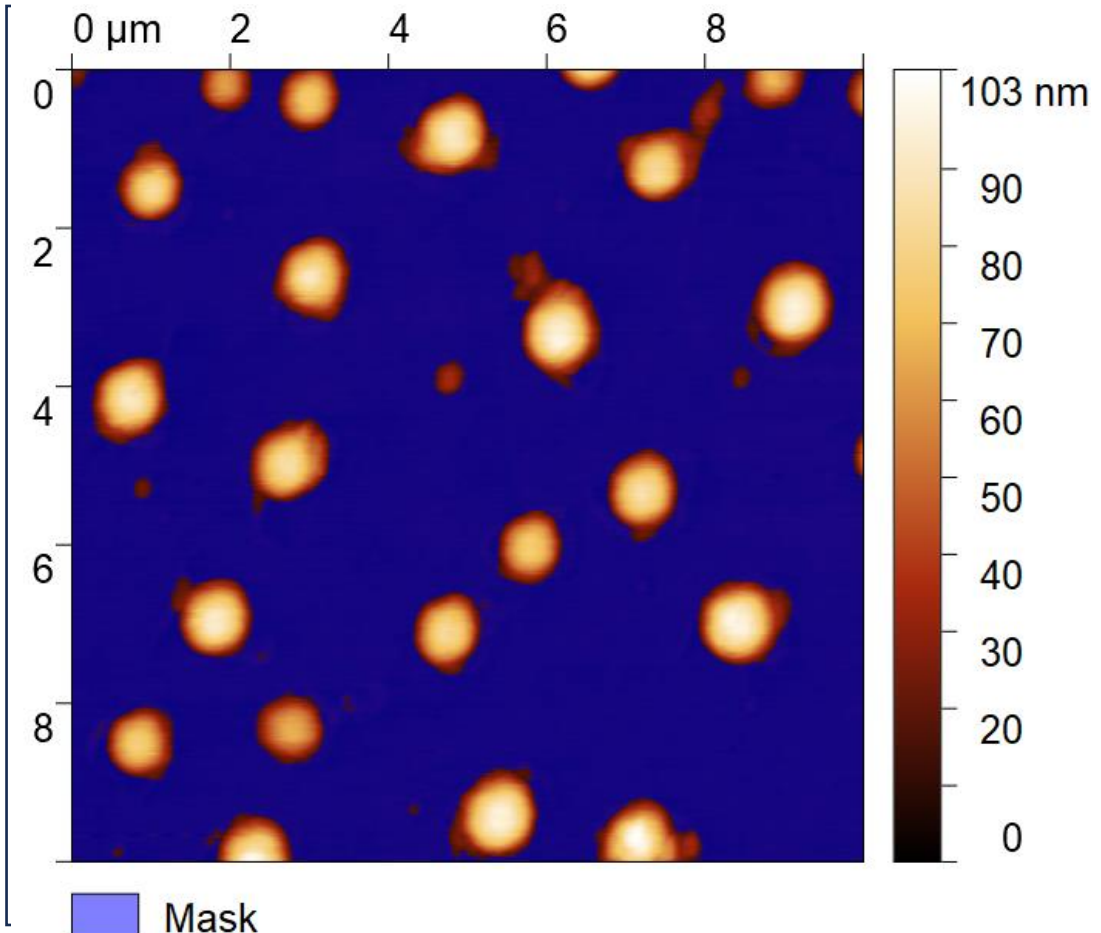
Area of Substrate = 3.69цm^2

(H)- 159 – $CHCl_3$ - 23°C - 4°C – 10^{-4}

Original Image



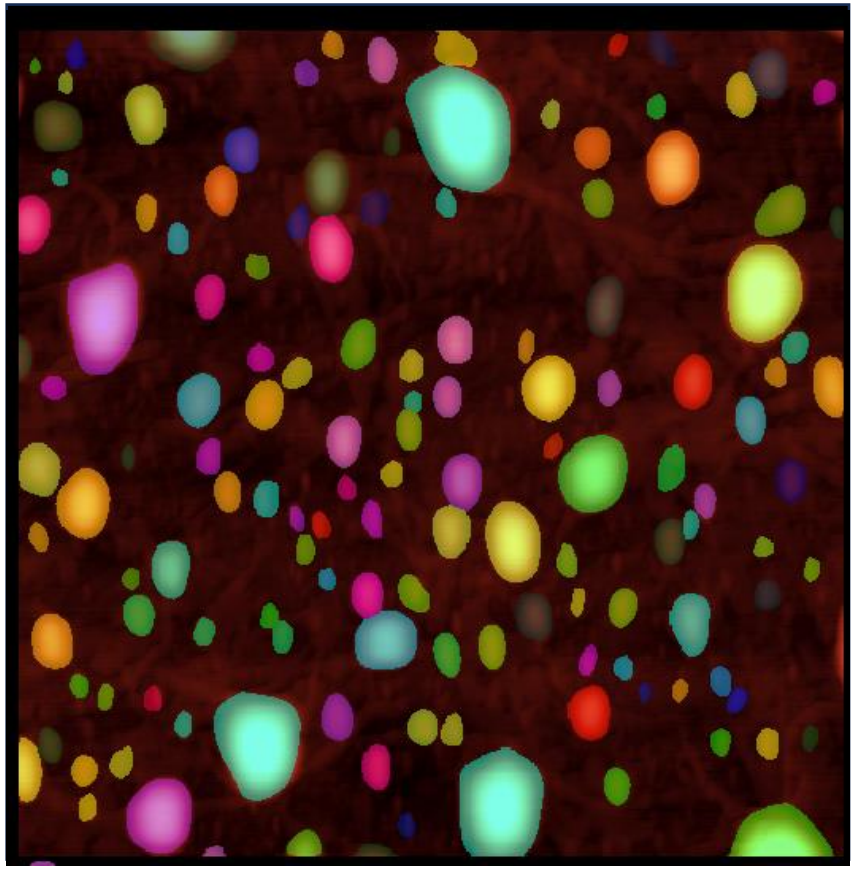
Gwyddion Mask



Masked %	**14.02**
Mask Height Value (µm)	**14.41**

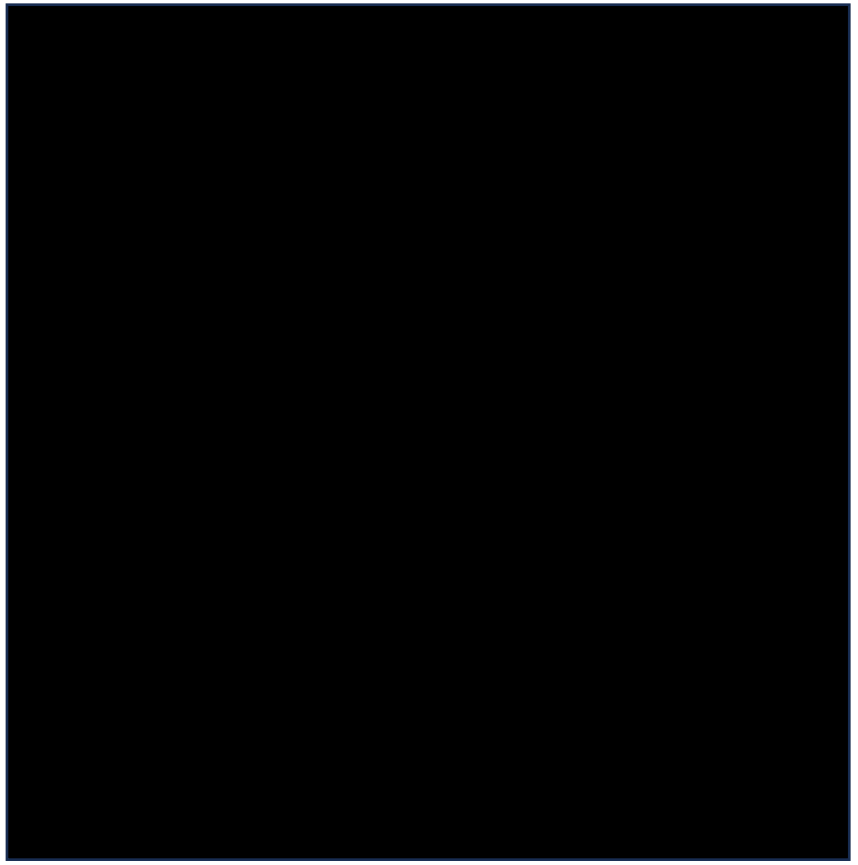
(A)- 156 – $CHCl_3$ - 23°C – 23°C – 10^{-4}M

Spheres



Area of Spheres = 24.74цm^2

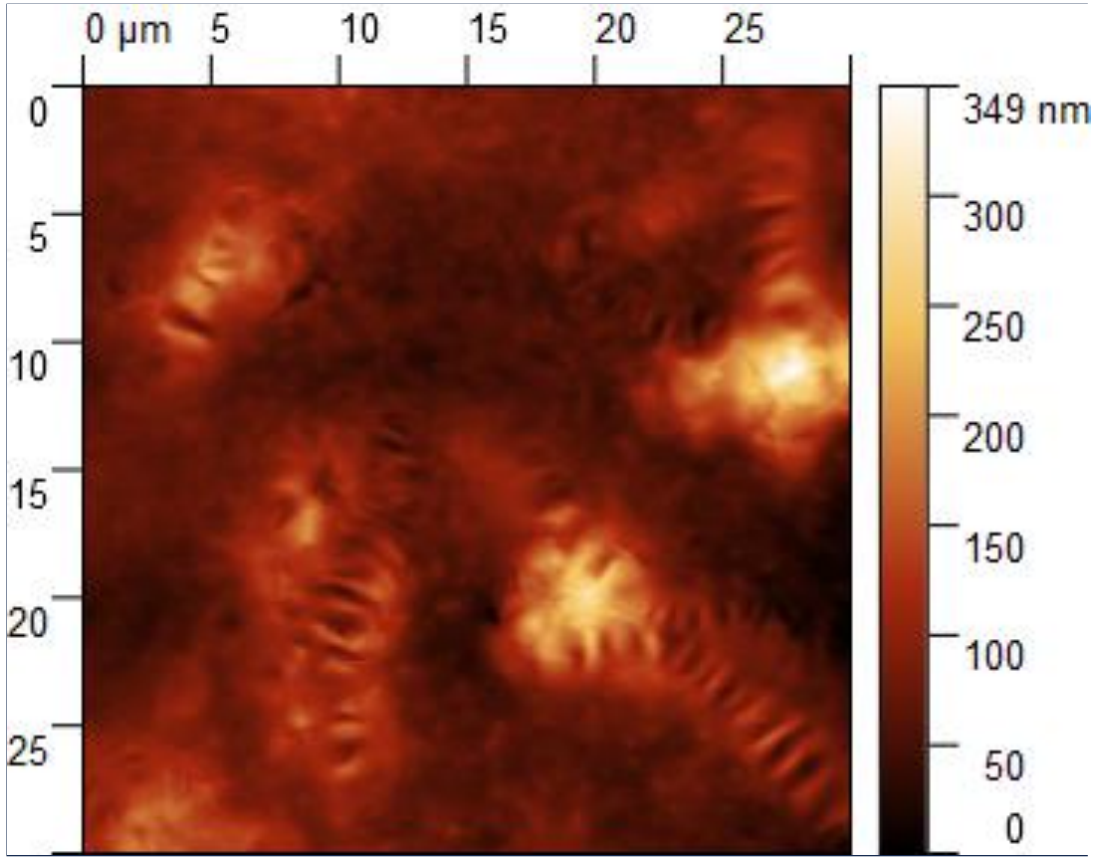
Substance



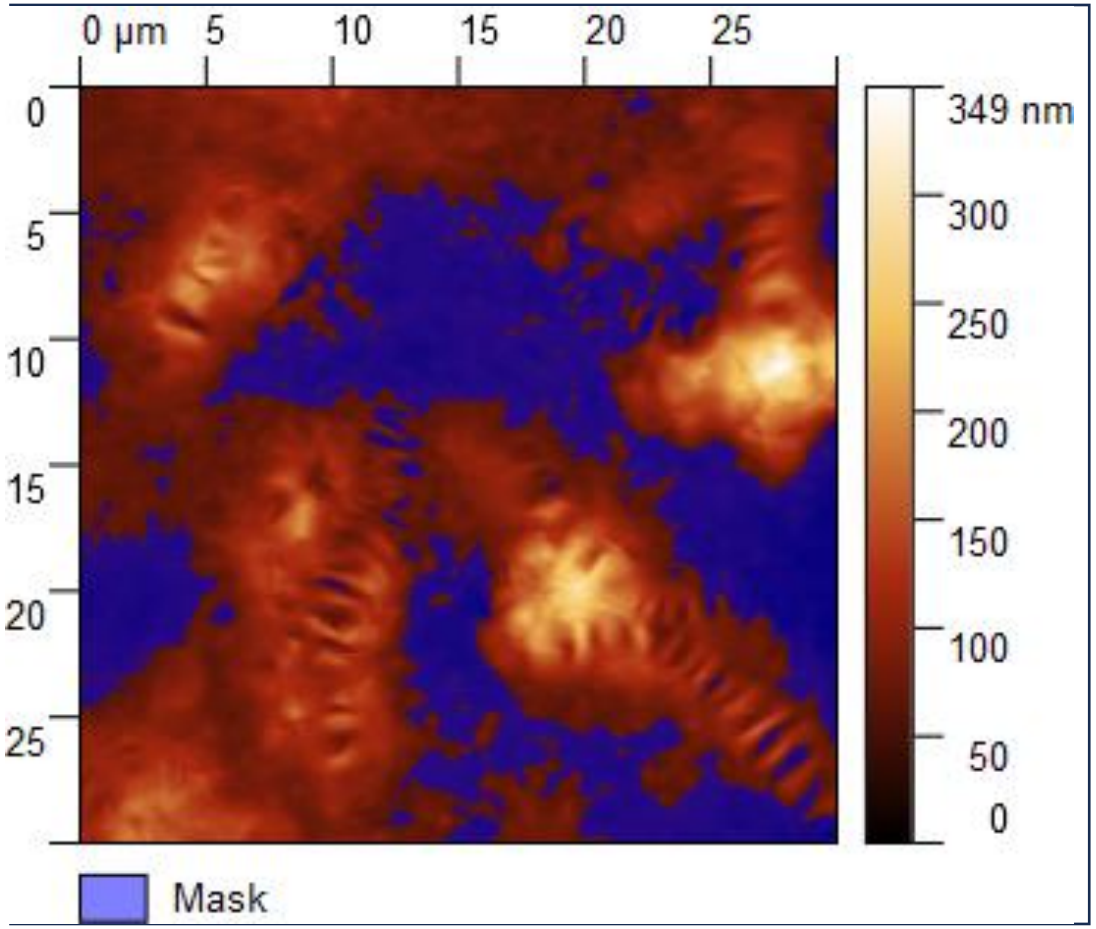
Area of Substrate = 100цm^2 or
area of full substrate/spheres

(O)- 159 – $CHCl_3$ - 4°C – 23°C – 10^{-4}M

Original Image



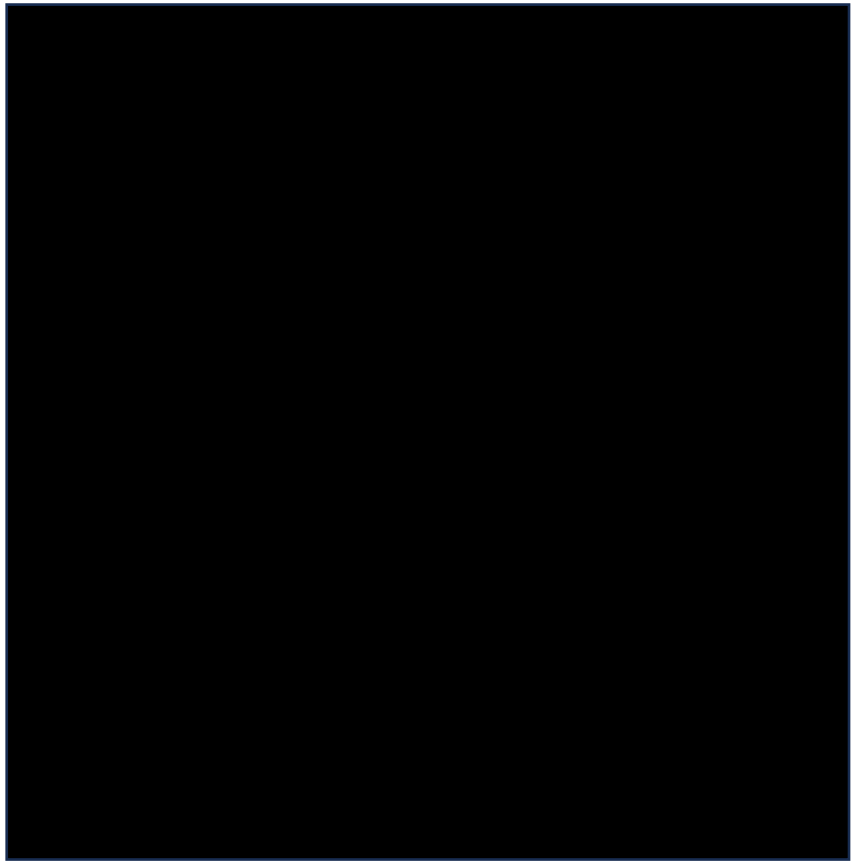
Gwyddion Mask



Masked %	**17.76**
Mask Height Value (µm)	**62.02**

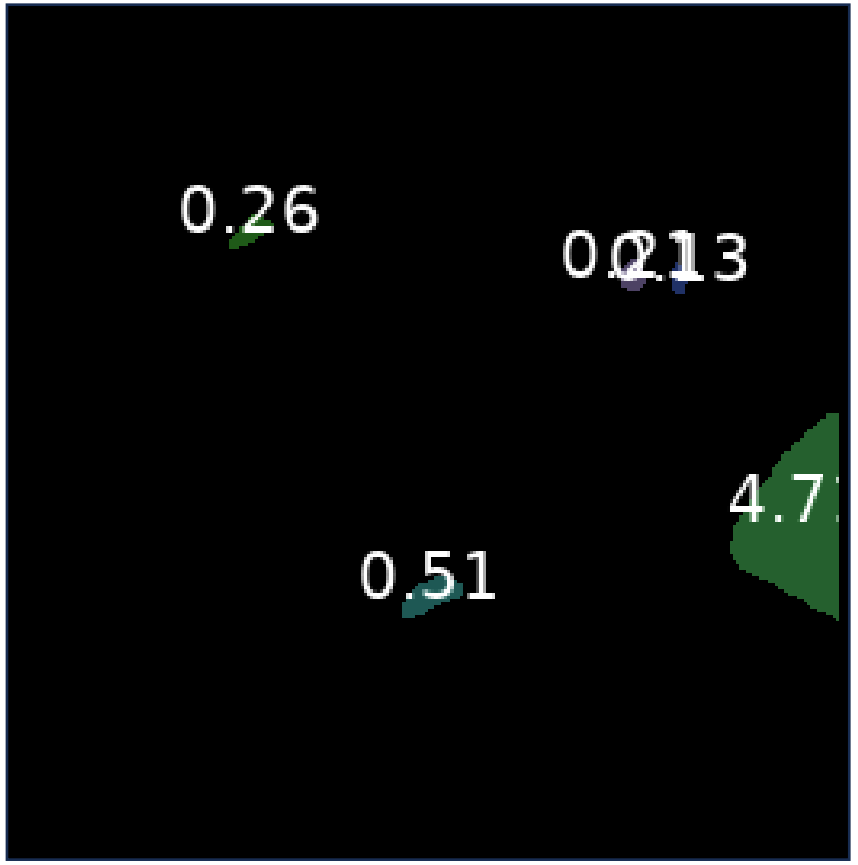
(A)- 156 – $CHCl_3$ - 23°C – 23°C – 10^{-4}M

Spheres



Area of Spheres = 0 цm^2

Substance



Area of Substrate = 5.82цm^2