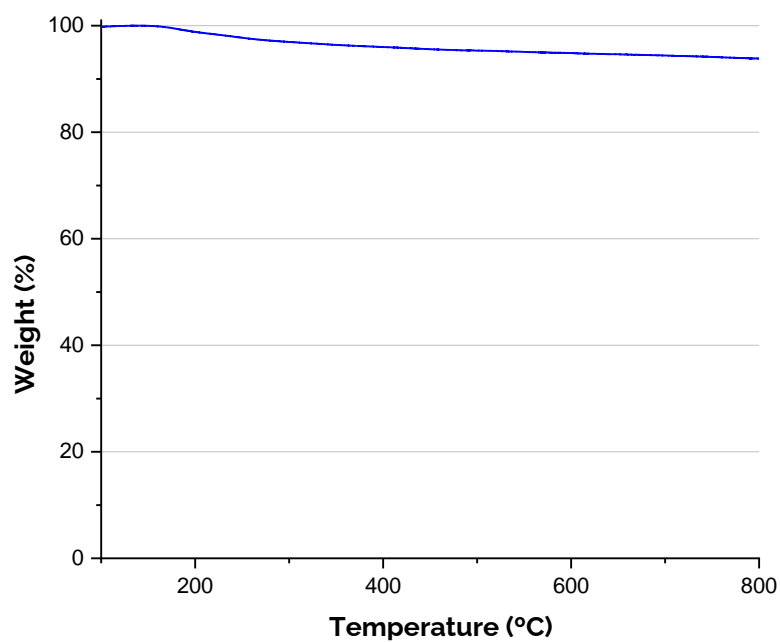


## 2D-MoS<sub>2</sub>

### CHARACTERIZATION OF THE LYOPHILIZED POWDER:

- ❁ **Thermogravimetric Analysis (TGA) - 2D-MoS<sub>2</sub> (N<sub>2</sub> -600 °C) = 5.3%**



**Figure 1.** Thermogravimetric analysis of 2D-MoS<sub>2</sub>.

- ❁ **Elemental Analysis** (average):

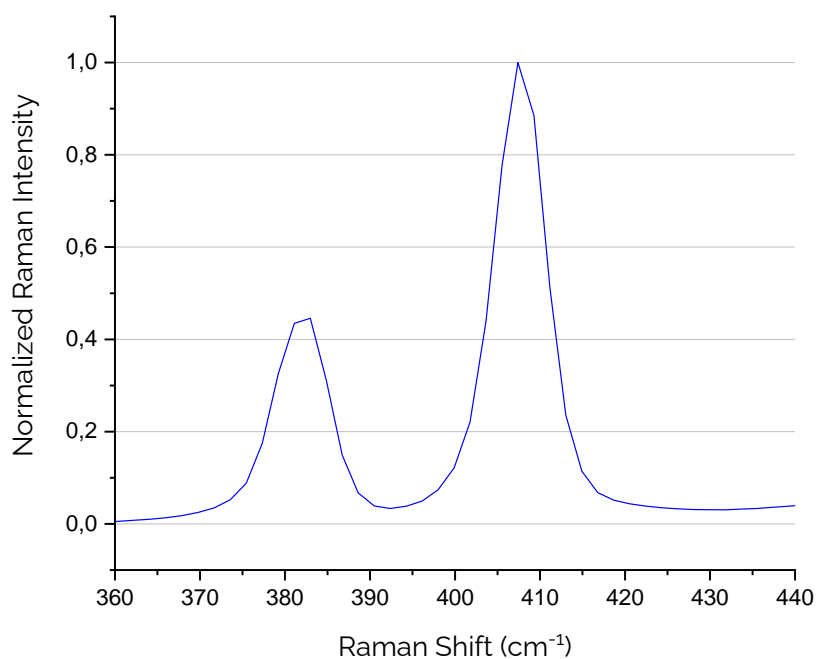
2.49±0.04 Wt%C – 0.79±0.02 Wt%H – 0.4±0.03 Wt%N – 34.62±0.06 Wt%S

- ❁ **Total Reflection X-ray Fluorescence (TXRF):** 0.339 mg/l Fe

Element	Line	Conc./ mg/l	Sigma / mg/l	RSD / %	LLD/ mg/l	Net area	Backgr.	Chi
Si	K12	134.02	0.96	0.7	0.42	32689	1149	2.92
P	K12	Not det.			0.21	18	1175	1.16
S	K12	10.52	0.14	1.4	0.14	9424	1800	0.90
Cl	K12	1.799	0.048	2.7	0.063	2652	961	0.83
K	K12	0.102	0.013	13.2	0.026	329	752	1.06
Ca	K12	0.776	0.018	2.3	0.019	3025	635	1.30
Ti	K12	0.034	0.006	18.5	0.012	252	948	1.48
V (IS)	K12	5.000	0.031	0.6	0.011	46960	1185	1.49
Cr	K12	0.103	0.005	4.5	0.007	1205	775	1.09
Mn	K12	Not det.			0.005	17	636	1.09
Fe	K12	0.339	0.005	1.5	0.004	6121	610	1.49
Cu	K12	0.008	0.001	14.1	0.002	254	498	0.81
Zn	K12	0.059	0.002	2.8	0.002	2108	490	0.99
As	K12	0.003	0.001	22.1	0.001	153	491	1.03
Br	K12	0.043	0.001	2.6	0.001	2478	567	0.98
Mo	L1	6.73	0.14	2.1	0.16	4096	1090	0.70
Pb	L1	0.006	0.001	15.2	0.002	214	415	1.15

❁ **Raman spectroscopy:**

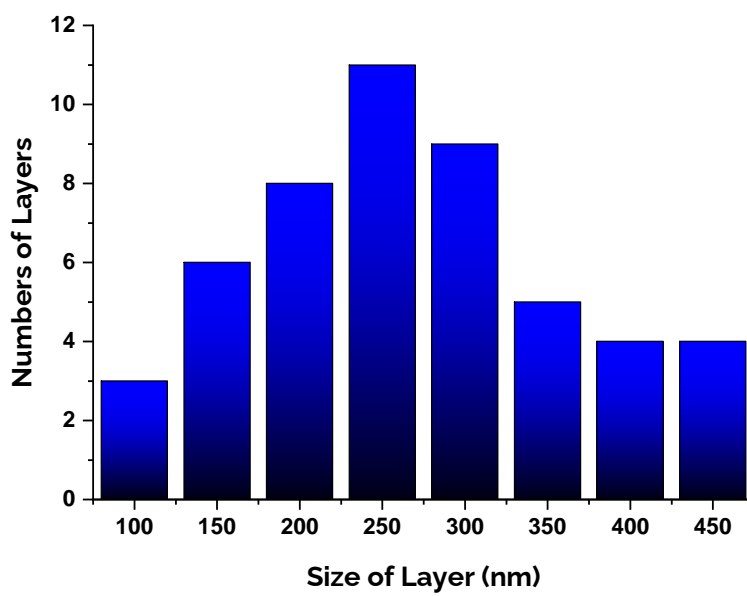
- $E_{2g}^1 = 380.04 \text{ cm}^{-1}$
- $A_{1g} = 405.83 \text{ cm}^{-1}$
- Number of layers= 3



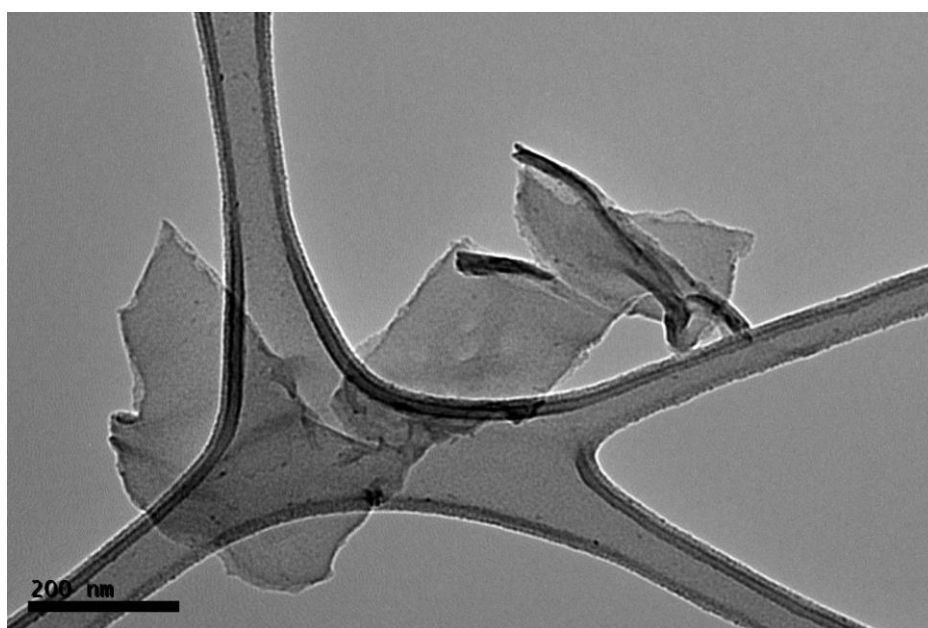
**Figure 2.** Normalized Raman spectrum of 2D-MoS<sub>2</sub> at 532 nm.

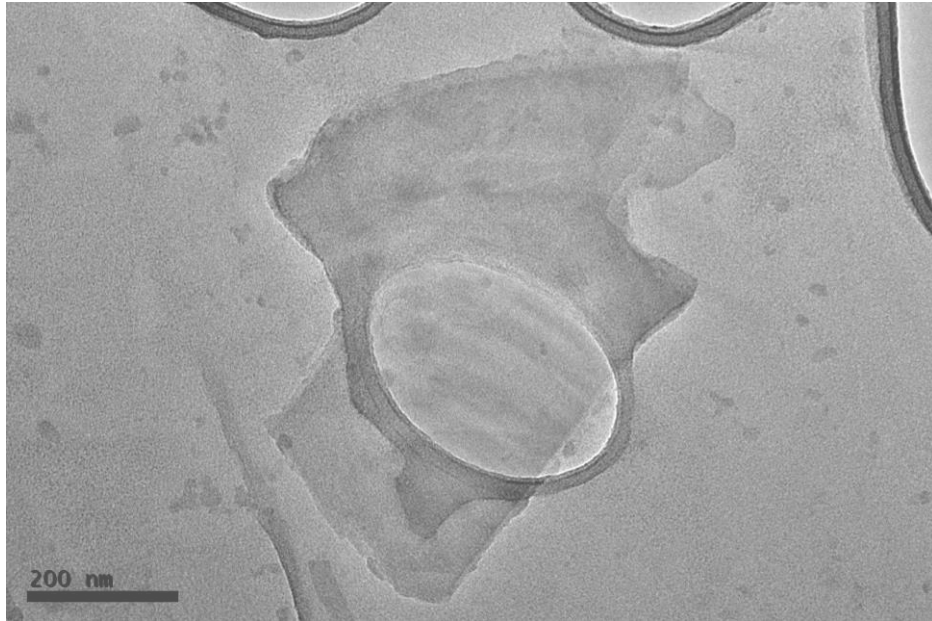
❁ **Transmission Electron Microscope (TEM):**

Average size:  $290.23 \pm 114$  nm



**Figure 3.** Lateral size distribution of ball-milled graphene from TEM images of 2D-MoS<sub>2</sub>.





**Figure 4.** Representative TEM images of 2D-MoS<sub>2</sub>.

❁ **Recommendations for use:**

- It must be stored at room temperature.
- It is possible to weight the amount of powders needed and disperse them in the necessary volume of solvent to reach the desired concentration.
- Sonication treatment (10 seconds cycles, maximum 2 minutes) are enough to obtain a good dispersion.