FEATURES OF LASER DESORPTION/IONIZATION MASS SPECTRA OF EXFOLIATED $MoSe_2$ AND WS_2 NANOMATERIALS

Zobnina V.G.*, Boryak O.A., Shelkovsky V.S., Kosevich M.V., Kuzema P.O., Karachevtsev V.A.

B. Verkin Institute for Low Temperature Physics and Engineering of the NAS of Ukraine,
Chuiko Institute of Surface Chemistry of the NAS of Ukraine
valezobnina@gmail.com

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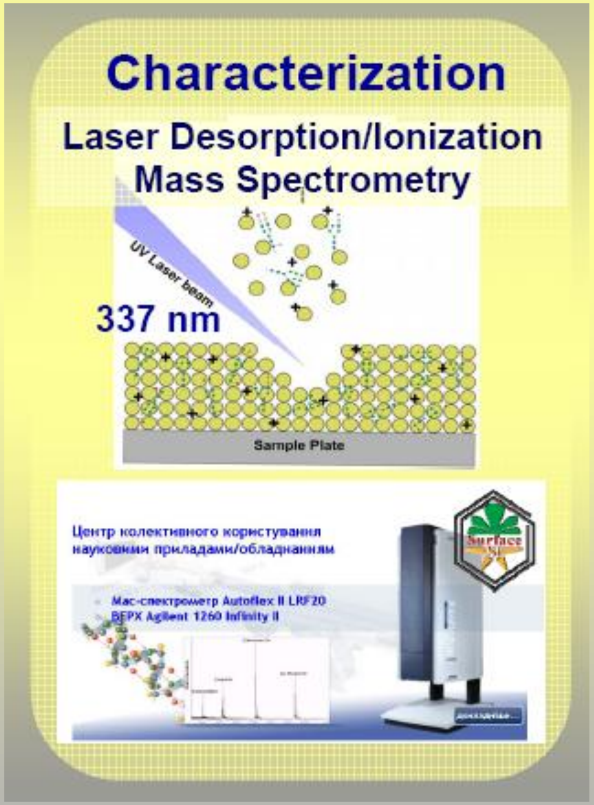
Inorganic nanomaterials are actively tested for various biomedical applications. 2D nanomaterials produced by exfoliation of transition metal dichalcogenides (TMD) MoS_2, $MoSe_2$, WS_2 are promising for photothermal therapy and drug delivery.



To evaluate the properties of these materials, suitable experimental methods must be applied.
Among mass spectrometric techniques, the desorption methods, such as laser desorption/ionization (LDI), are the most informative for testing inorganic solids.

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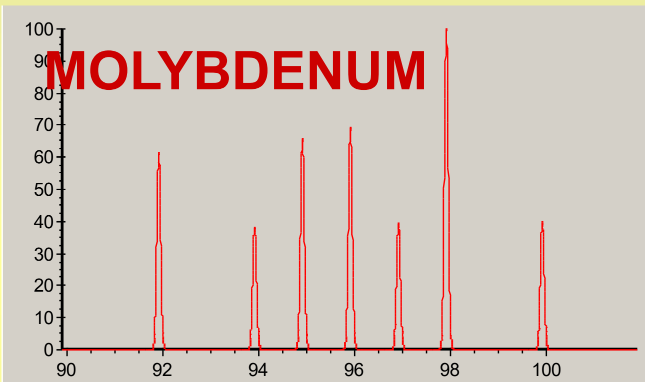
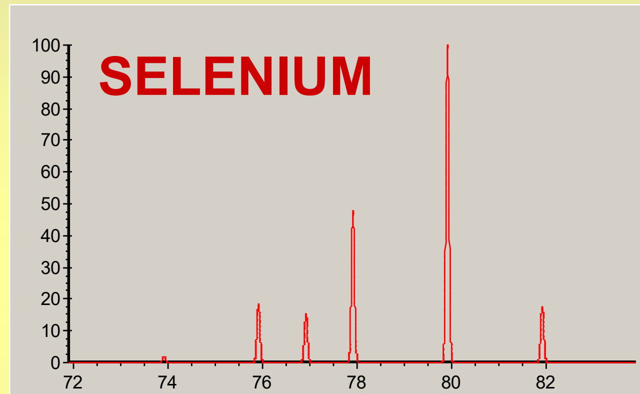
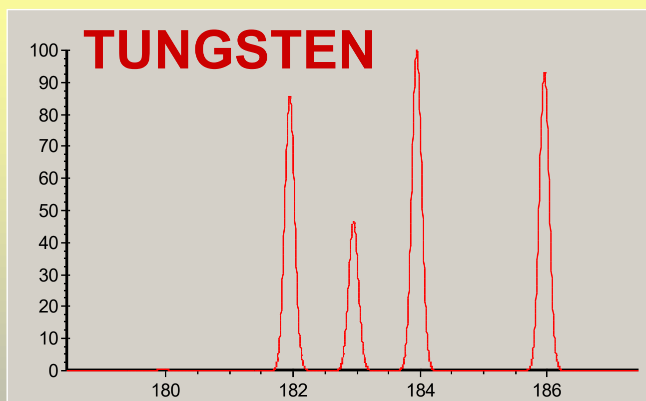
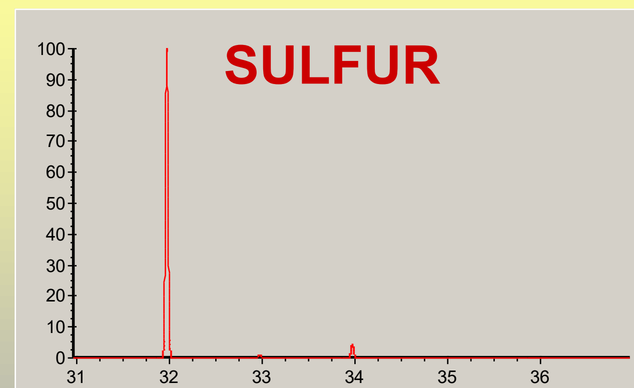
The primary complication in interpreting the TMD spectra is caused by the polyisotopic nature of the Mo, W, Se, and S elements.

Calculated isotopic distributions:









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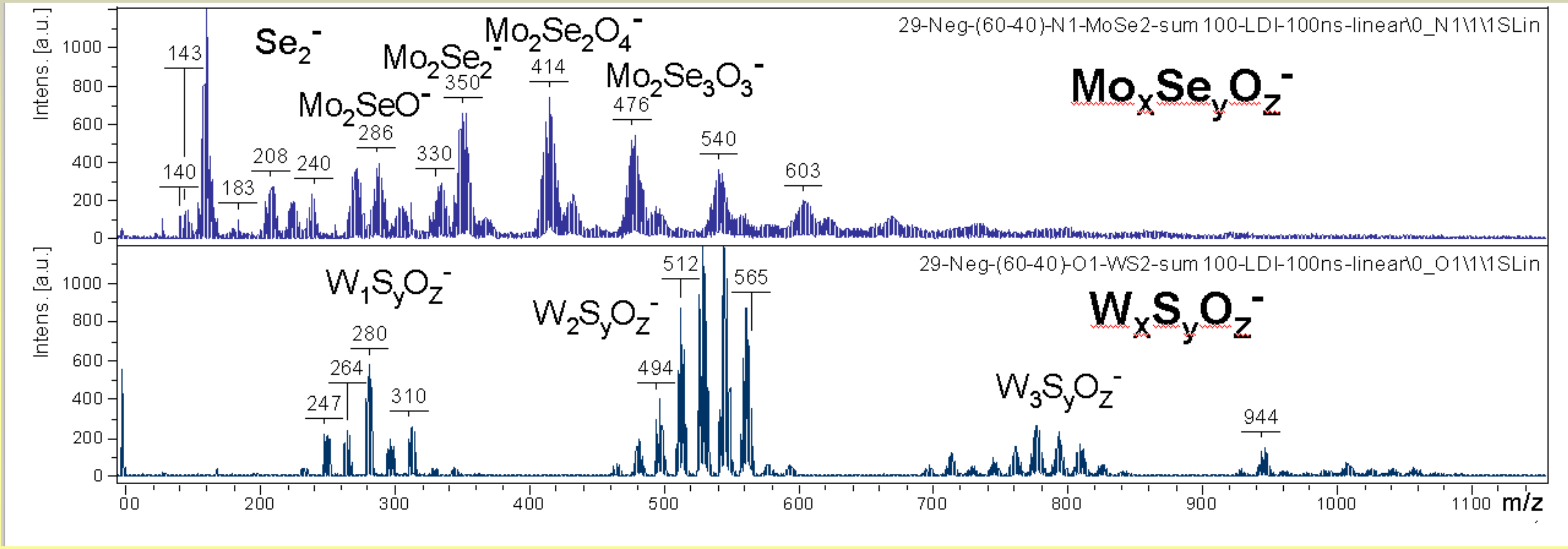

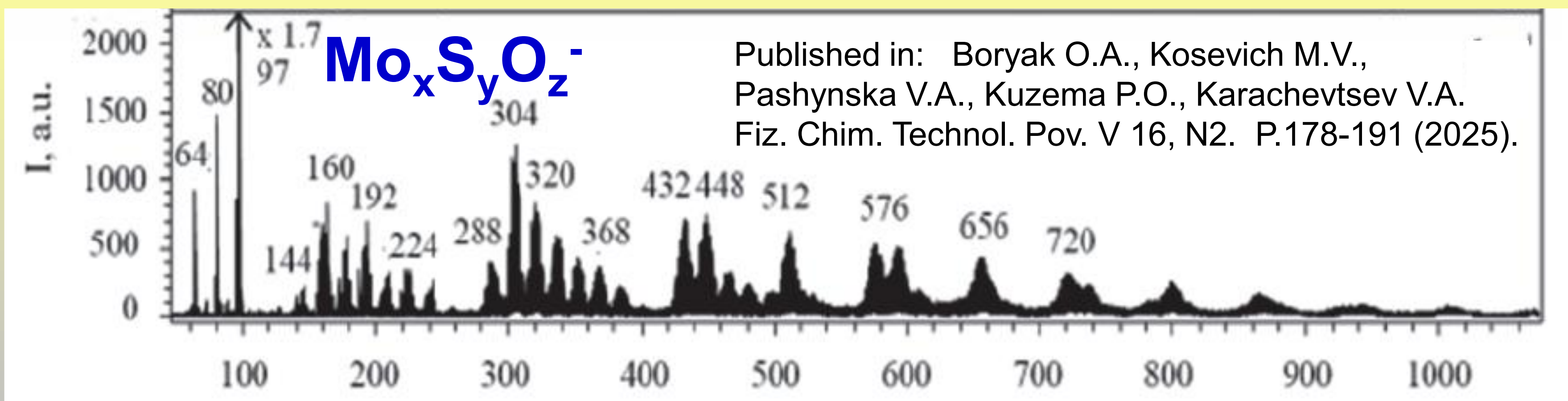

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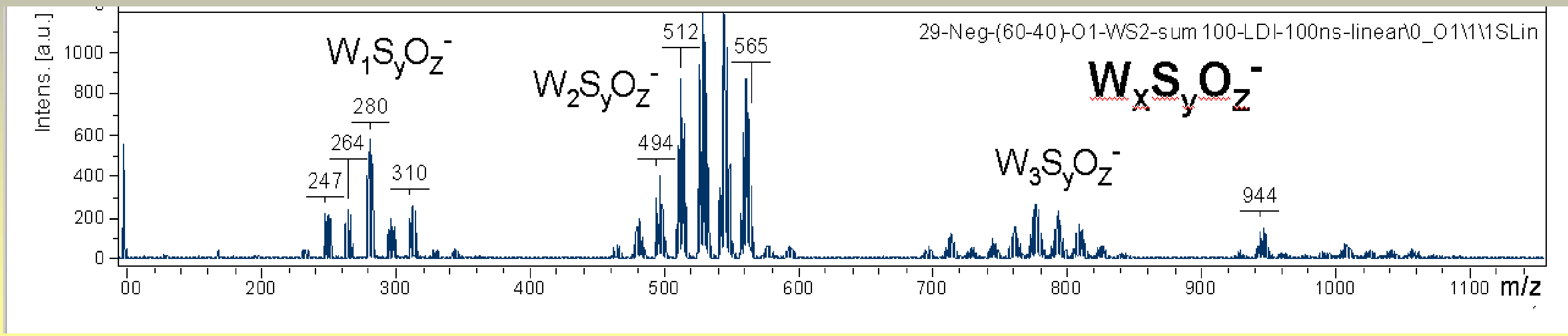
LASER DESORPTION/IONIZATION MASS SPECTRA



There are three groups of peaks in the LDI mass spectrum of WS_2, which belong to isotopic peaks envelopes of $W_xS_yO_z^-$ clusters containing one, two, and three atoms of W.
Such a pattern is similar to the $Mo_xS_yO_z^-$ distribution characteristic of MoS_2 .

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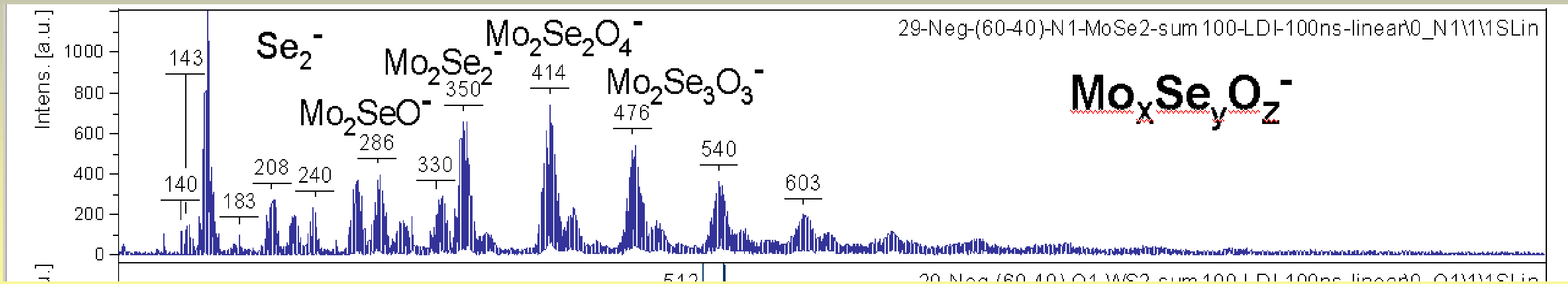

Substitution of sulfur for selenium in $MoSe_2$ causes changes in the composition of the sputtered $Mo_xSe_yO_z^-$ clusters: a series of clusters containing two Mo atoms dominates the spectrum.