

TUNGSTATE SOLID PHASE EXTRACTION USING LAYERED DOUBLE HYDROXIDE FIBERS

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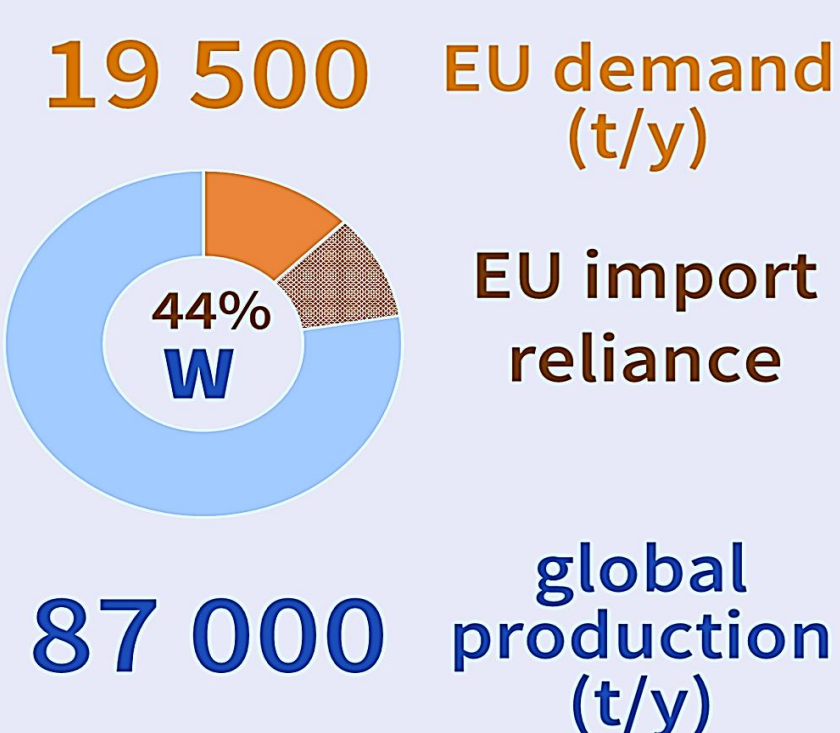
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Recovery of Tungsten, Niobium and Tantalum occurring as by-products in mining and processing waste streams



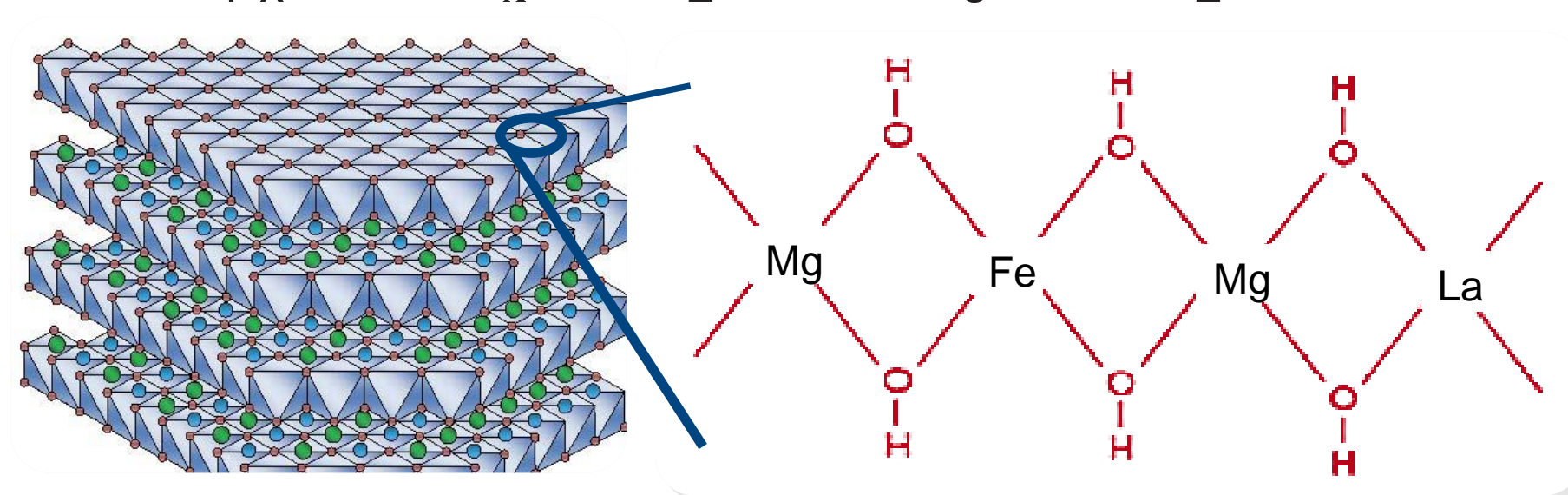
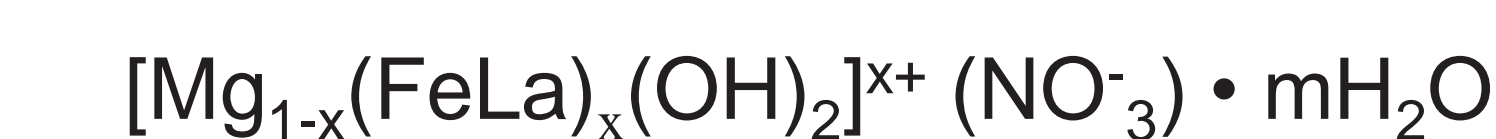
EU H2020 project

www.h2020-tarantula.eu

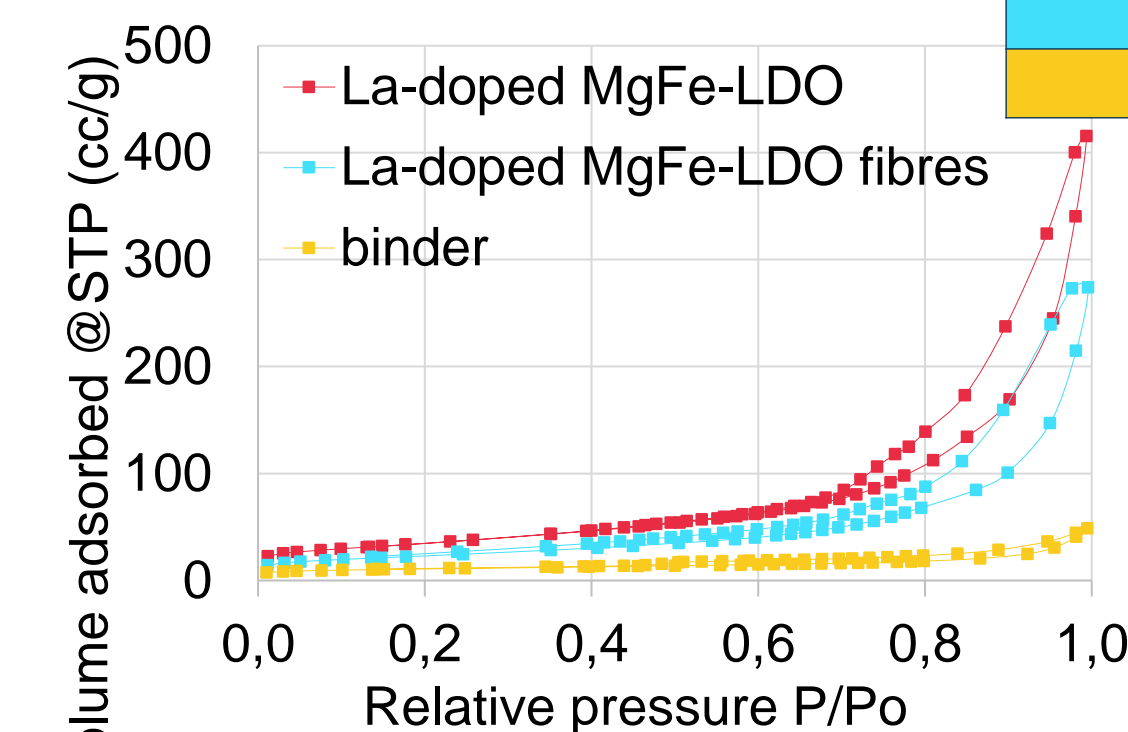
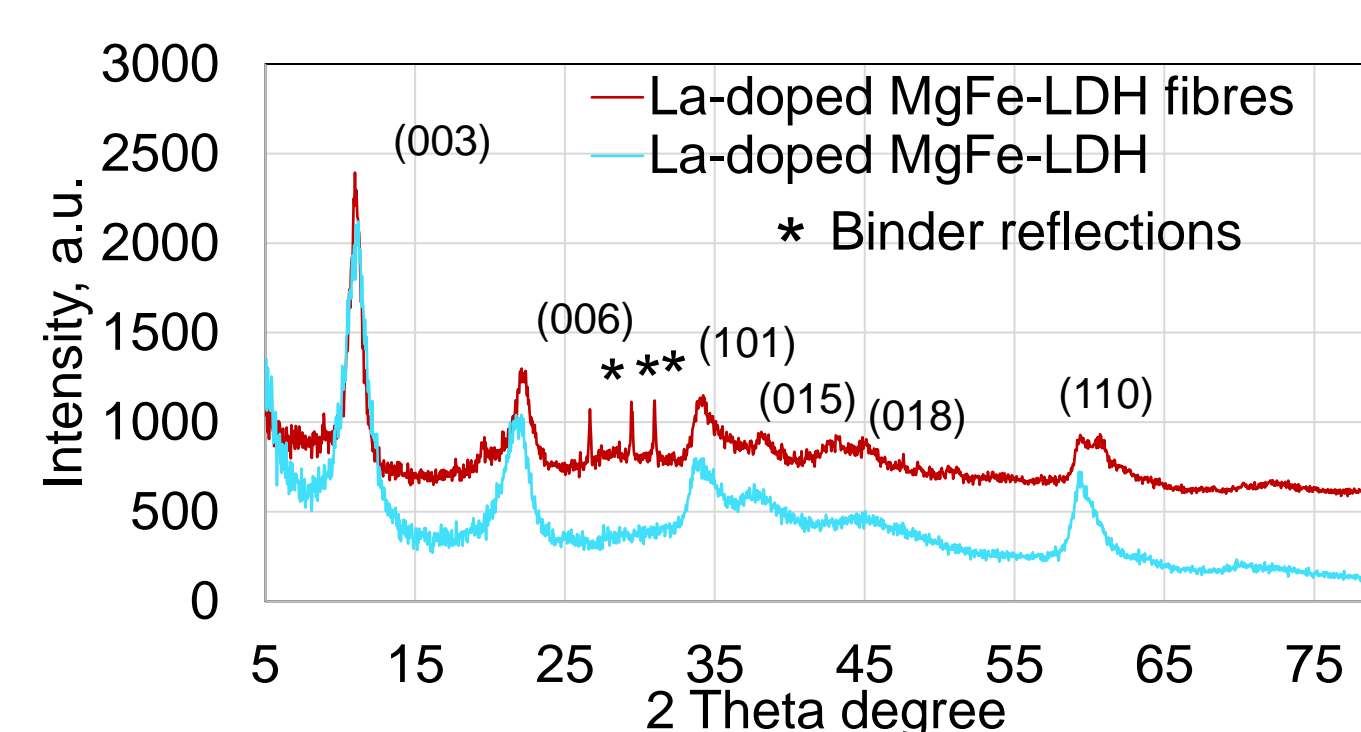


WO₄²⁻ recovery using Layered Double Hydroxide fibres

LDH synthesis and characterization



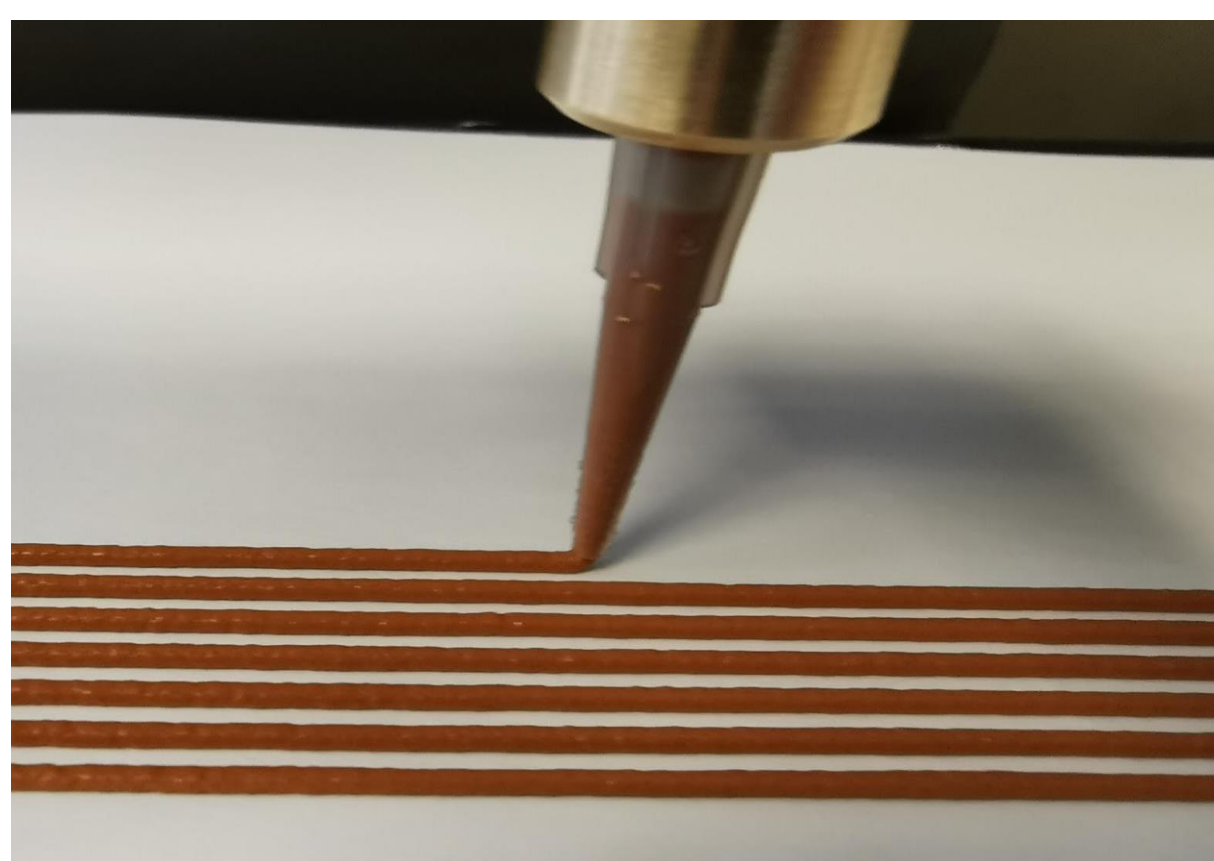
Cristal structure and porosity characteristics



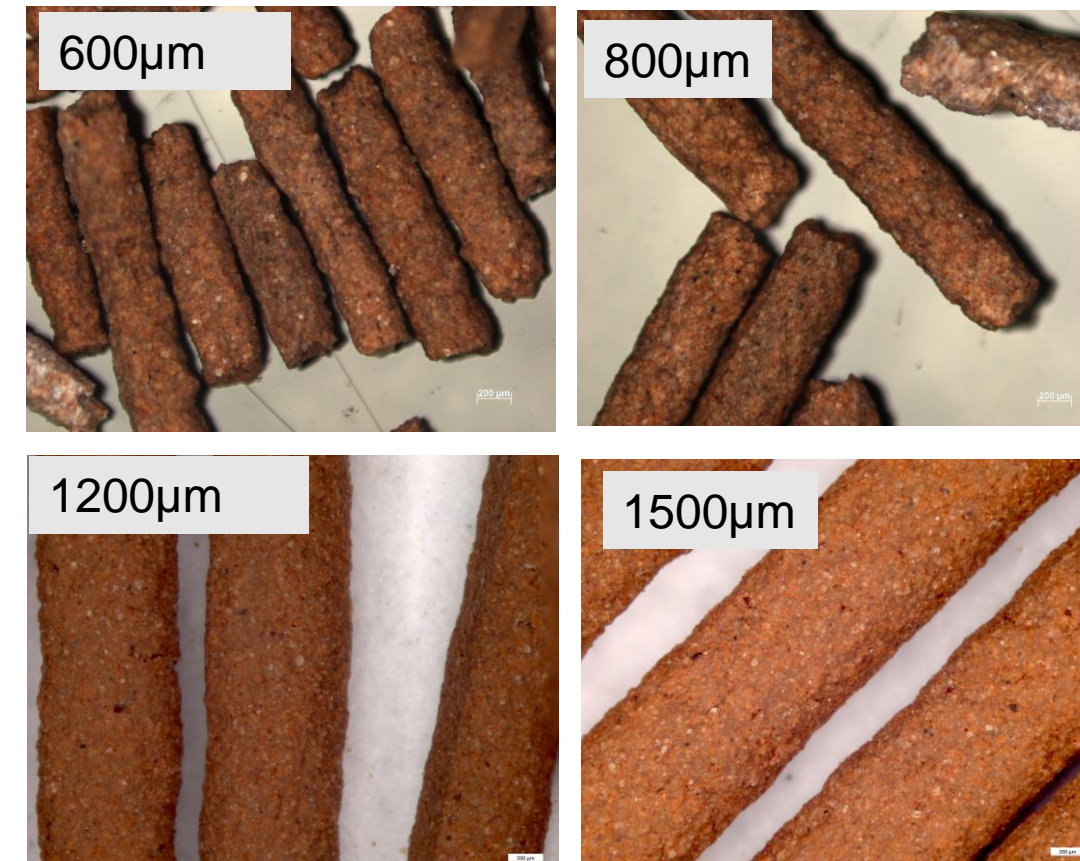
Surface area
125 m ² /g
81 m ² /g
35 m ² /g

Micro-extrusion of LDH fibers and characterization

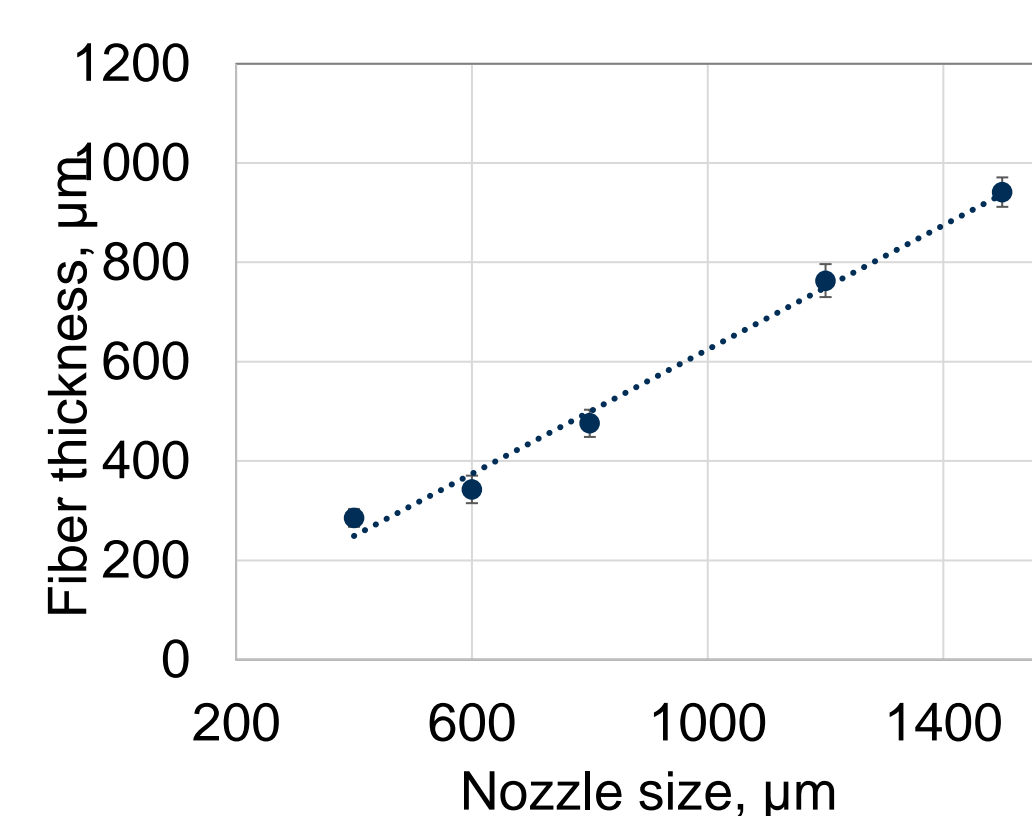
Micro-extrusion of fibres



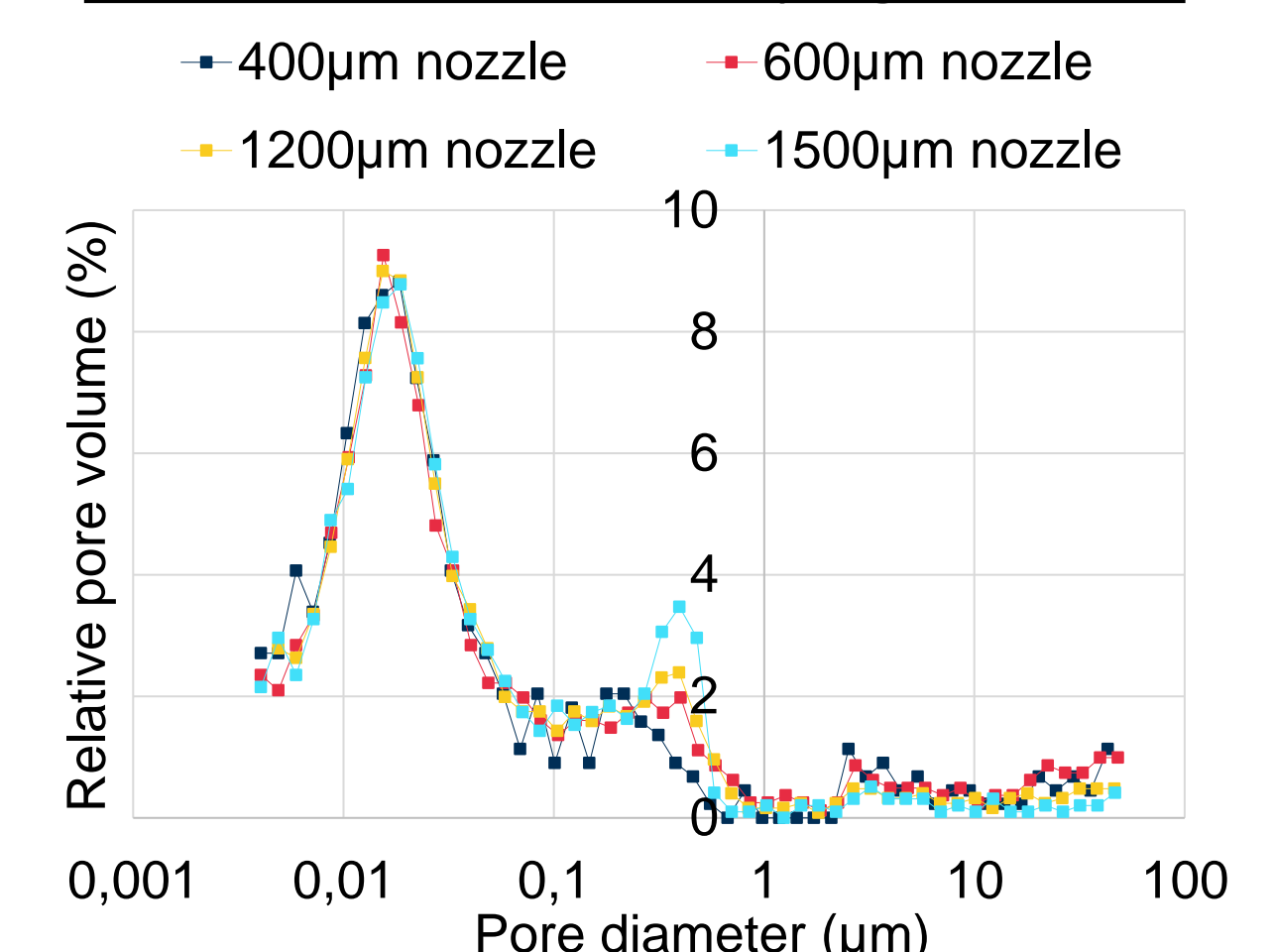
Optical microscopy



Fibre size thickness vs. nozzle size



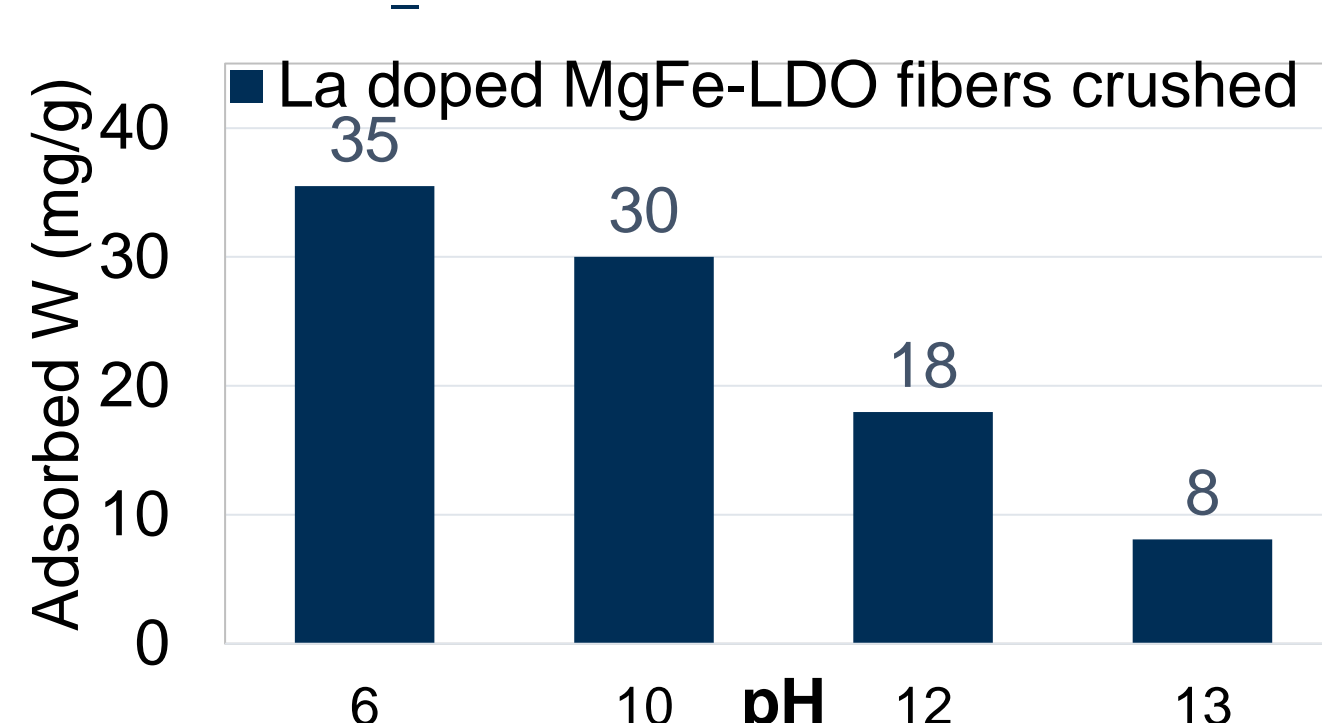
Pore size distribution by Hg intrusion



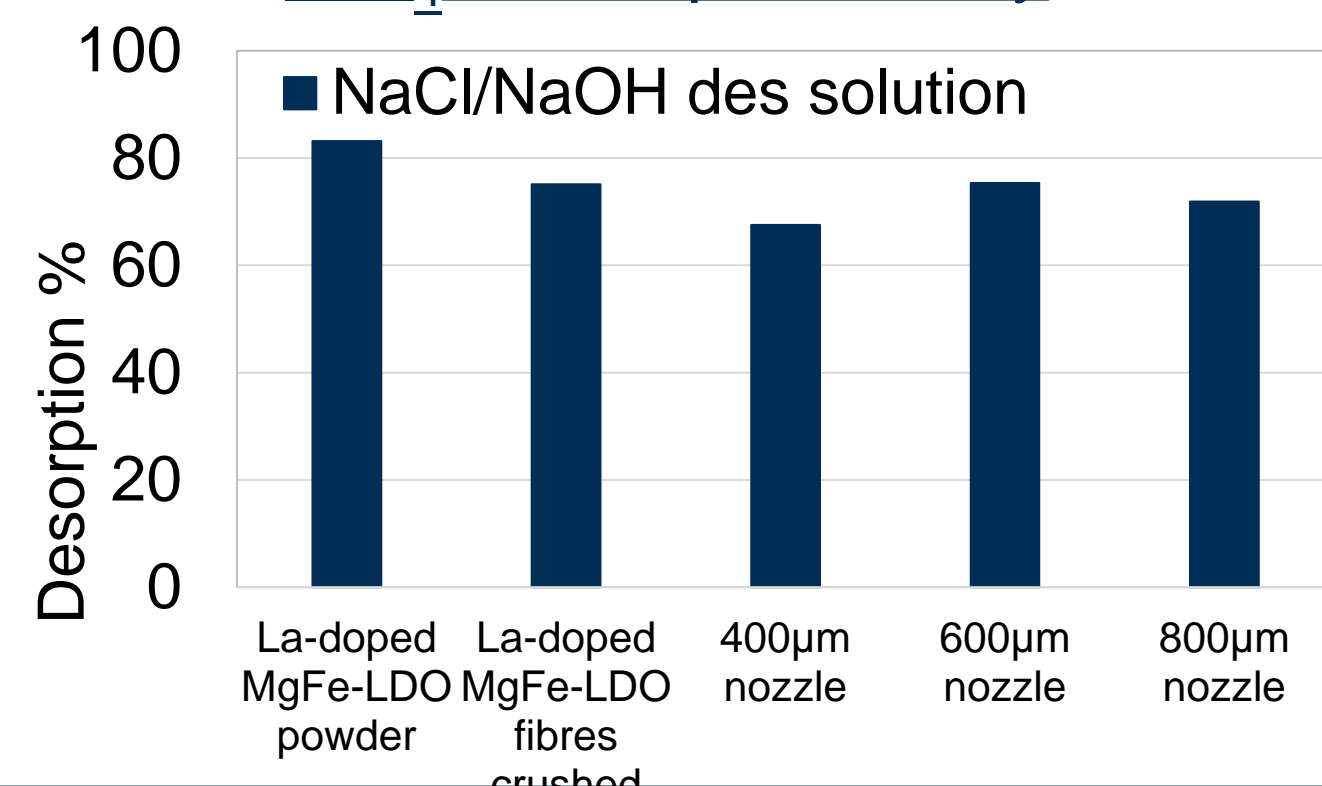
WO₄²⁻ recovery

Study on WO₄²⁻ recovery from single element solutions

WO₄²⁻ adsorption study

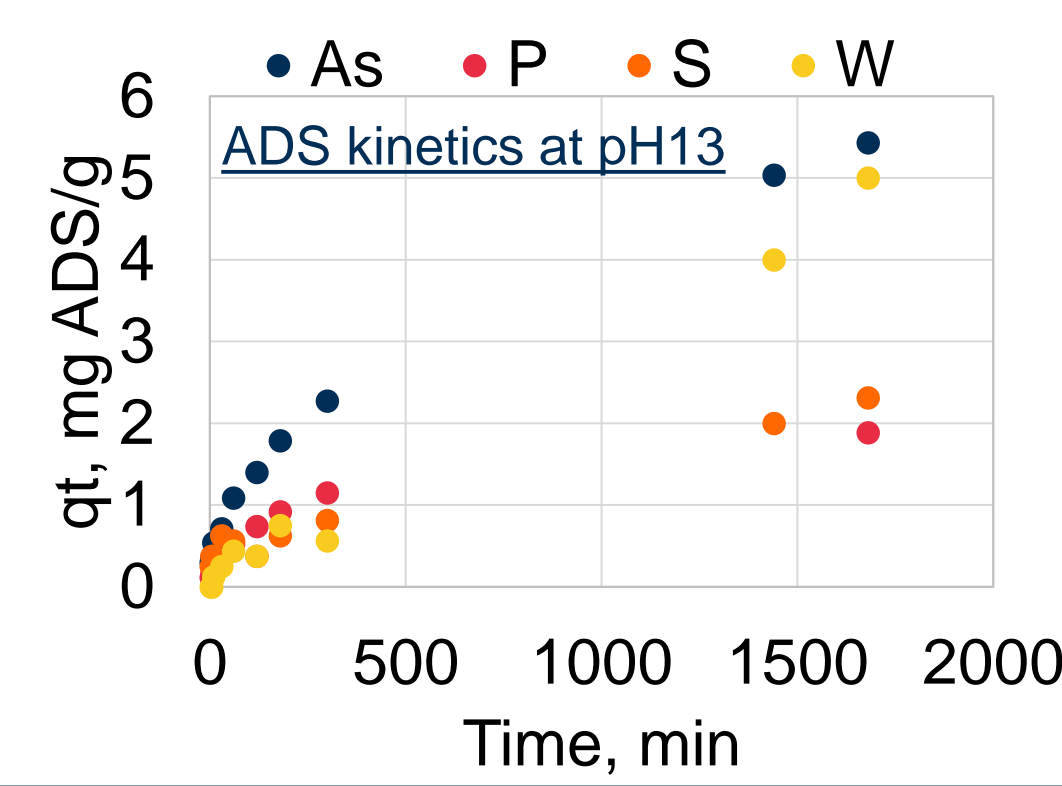
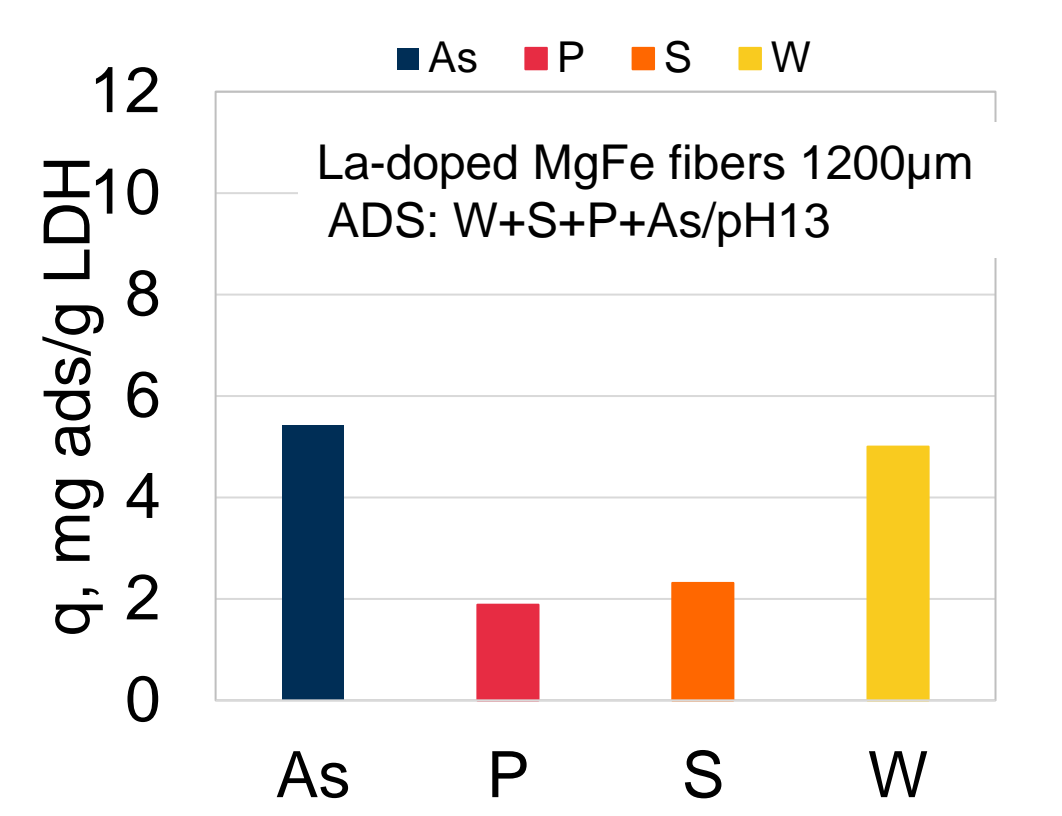


WO₄²⁻ desorption study



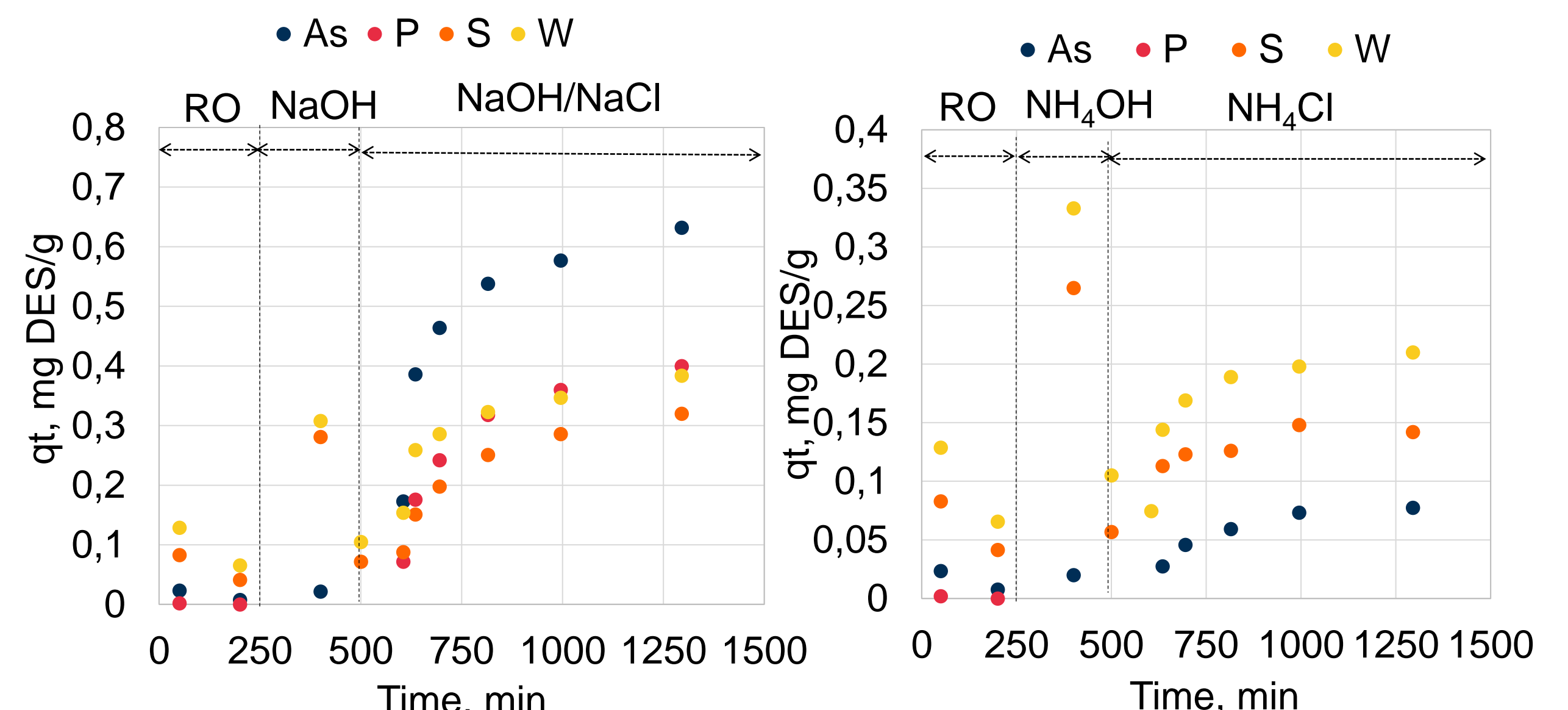
Study on WO₄²⁻ recovery from complex solutions at pH13

1/ ADS from simulated leachate at pH 13



Simulated leachate composition				
pH13	As	P	S	W
mg/L	55	15	120	190

2/ DES kinetics in various des solutions



Conclusions

- ✓ Synthesis and micro-extrusion of fibers containing LDH with innovative composition by doping with La on a MgFe – LDH lattice was optimized
- ✓ The La doped MgFe – 3D fibers show good sorption capacity at pH 13 (~8mgW/g)
- ✓ The selectivity for W sorption is affected by the presence of coexisting oxyanions
- ✓ Complete selectivity recovery of was not achieved, still impurities of mainly As and P were present in the desorption solutions and further optimization is required to tackle the selectivity issues

ACKNOWLEDGEMENTS

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