Direct writing on $PbWO_4$ monocrystalline using X-rays

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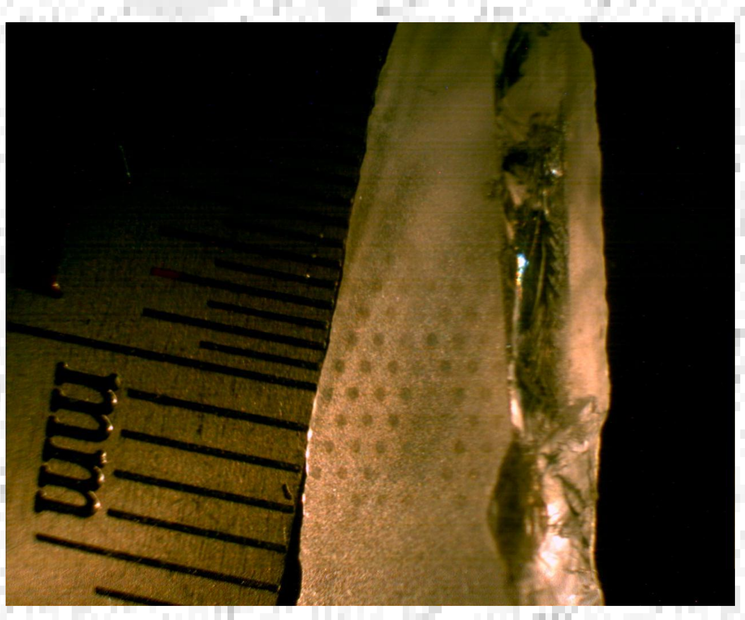
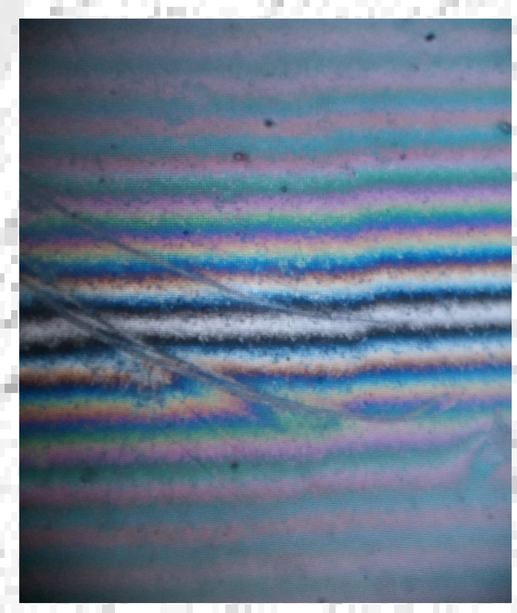
The lithographic profile on the material surface is usually based on making structural changes in the intermediate - technological layer using radiation, and the subsequent transfer of the resulting topology to the underlying layer of the functional material. However, not all materials enable the removal process that meets the sufficient selectivity value. This report presents the results of direct writing a relief on an inorganic $PbWO_4$ crystal using synchrotron radiation in the X-ray range.

X-ray stimulated profiles on the $PbWO_4$ - surface



First observation of x-ray direct writing on $PbWO_4$ monocrystalline in water as black circles

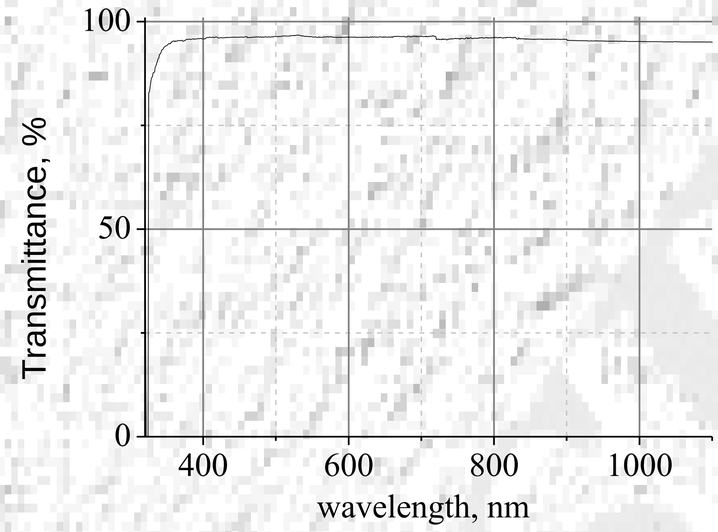
An exposed (left) and unexposed (right) areas in reflected light



Interference pattern from the $PbWO_4$ – surface: exposed (left) and unexposed (right)

Monocrystalline transformation under X-rays

Exposure cell filled with deionized water



Star shaped test microstructure of 65 μm high on copper substrate.

Acknowledgement
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Litherature

E.S.Gluskin, A.A.Krasnoperova, G.N.Kulipanov, V.P.Nazmov, V.F.Pindurin, A.N.Skrinsky, V.V.Chesnokov, Experiments on X-ray lithography using synchrotron radiation from the VEPP-2M storage ring, Nuclear Instr.Meth. in Phys.Res., v.208 (1983) 393-398.

Conclusion

For the first time in the world, the process of etching lead tungstate in water under the influence of x-ray radiation was recorded