# Variation of nanopores cross sections obtained by etching of swift heavy ions tracks in olivine irradiated along different crystallographic directions

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d) Etching •WN-solition: 40g EDTA, 1g oxalic acid, 1ml orthophosphoric acid, 100мл вода







#### Results Atomic-force microscopy AISN-NT Smart SP 1000





**Molecular dynamics of structure transformations in lattice [3]** 



Structure transformation of  $Mg_2SiO_4$  lattice after Xe 156MeV ion

### Original algorithm of determination and remove of the surface atoms



### **Results**



On the each stage of simulation Mg atoms with the smallest bounding energy is primary removed. SiO<sub>4</sub> with 1 or 0 Mg bounding atoms are removed then



Nanopores with elliptical cross Nanopores with elliptical cross section ~60\*120nm section ~120\*300nm



### **Pore shape depends on crystal orientation**

## Conclusion

•Etching of olivine, irradiated with swift heavy ions, may be used for the synthesis of nanopores with non-circle cross sections.

• Simulation demonstrates that the shape of cross section of nanopores may be controlled by rotation of crystal axes relatively to the beam direction.

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#### References

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