

## Producing of the multimodal nanopowder SiO<sub>2</sub> by using of pulsed electron beam

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Pulsed electron beam is the powerful tool for formation the defects in the solid states [1]. Producing of multifunctional materials with the demanded physicochemical properties is an actual problem of modern physics [2]. In this work by the pulsed electron beam evaporation of target from nonmagnetic nanopowder (NP) Aerosil 90 is produced the bimodal magnetic and luminescent NP SiO<sub>2</sub> with a high density of defects, perspective for use in spintronics, magnetic resonance imaging, fluorescence microscopy, etc. areas. The specific surface area of the produced NP SiO<sub>2</sub> increased from 90 (Aerosil 90) up to 155 m<sup>2</sup>/g, the diameter of nanoparticles decreased from 20 to (5-10) nm, the sintering temperature of powder went down on 200 °C. The data of X-ray and electron diffraction, the chemical analysis, various spectral methods confirmed the defining role of structural defects in formation of magnetic and luminescent properties in amorphous NP SiO<sub>2</sub>.

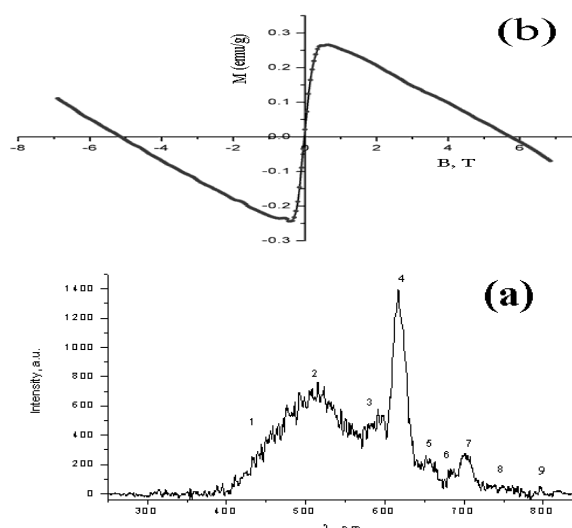


Fig.1 Anhyseretic magnetization curve of undoped SiO<sub>2</sub> NP in magnetic field  $\pm 7$ T (1); Cathodoluminescence spectra of SiO<sub>2</sub> NP (2).

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### References

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