

## White light emitters based on AlN nanopowders

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At present the main lighting elements available for customers are luminescent lamps (LL) and light emitting diodes, therefore, elaboration of new prospective materials emitting white light is actual. As is known to produce artificial white light there is necessary to mix light beams at least of three colors such as blue-green-red. Our long time studies on luminescence of AlN allowed conclusion that this material is appropriate for elaboration of white light emitter. It was found that pure AlN nanopowder is blue light emitter [1], AlN:Tb emits yellow light [2] but AlN:Mn – red light [1].

AlN, AlN-Tb and AlN-Mn nanopowders were synthesized in Institute of Inorganic Chemistry at Riga Technical University. Luminescence characteristics of these materials (emission and excitation spectra) were studied. Mixtures of three different nanopowders were made and their luminescence spectra were studied dependent on reciprocal concentration of ingredients. Luminescence spectrum of mixed AlN based nanopowders with optimal concentrations of ingredients is shown on Fig. 1 (curve 1). It is seen that the total luminescence spectrum is in a good agreement with that of the Sun emission spectrum (curve 2) within the whole spectral region detectable for human's eye. As a result - a new luminescent material is elaborated based on AlN nanopowders. This material emits white light under ultra violet light irradiation including 254 nm line of Hg emission and is available for LL.

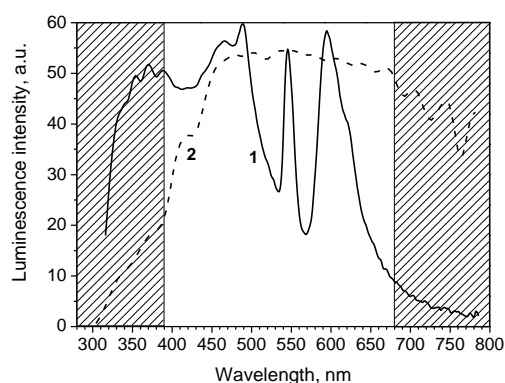


Fig.1 Luminescence spectrum under 263 nm light excitation of AlN based nano-materials (1) and the Sun emission spectrum at see level (2). The white square demonstrates a spectral region detectable for human's eye.

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### References

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