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Development of an AI Tool for Systematic Review of Scientific Articles Containing IR-Spectra of Boron Nitride Nano- and Microparticles

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Abstract. In this work a creation of neural network method and its application to exploration of optical-property data of hexagonal boron nitride nano- and microparticles is presented. In particular, the method analyses the data of electromagnetic absorption in the infrared region. The work shows how modern algorithms of natural language processing and deep-learning can be used for automatization of search and analysis of raw data. In the work we apply deep neural network models including convolutional neural network (CNN) for review of infrared spectra and transformers (SciBERT, ChemBERTa) for examination of text information. Multimodal learning, integrating CNN and semantic analysis of texts, was developed for survey heterogeneous data.

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