

Summary of PhD thesis: „**Optical properties of epitaxial III-V quantum dots grown on InP substrate**”.

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Self-assembled quantum dots are an attractive material in the context of both basic research as well as in the context of applications in various branches of optoelectronics. In the case of structures produced on the InP substrate it is possible to obtain light emission in the telecommunications range, hence the potential applications of the studied structures as part of active lasers or optical amplifiers. The characteristic properties of quantum dots also make it possible to use them as non-classical light sources, such as single photon sources.

The aim of the research conducted as part of the doctoral thesis was to learn the optical properties of structures with InAs quantum dots on InP substrate. These properties vary depending on the morphology, the barrier material or surface density of quantum dots. Studies were carried out that allowed to determine the influence of factors such as growth parameters or barrier material type on the recognition of physics and electronic properties of quantum dots. Optical measurements were performed both in the context of emission and absorption from an ensemble of quantum dots, as well as in the regime of individual quantum dots. Optical spectroscopy tools such as photoluminescence measurements, microphotoluminescence, excitation photoluminescence, time-resolved measurements, and magneto-optical experiments were used. Interpretation of the obtained results has been supported by the results of theoretical calculations and literature data.

The results presented in the doctoral thesis contribute to the recognition of a new type of materials such as InAs quantum dots on the InP substrate both from the basic physical properties, but also from the point of view of potential applications in optoelectronic devices.