Secondly, calculated refractive index spectrum of such films (Fig. 2, spectrum 2) is much lower than the analogous spectrum *n*(λ) (Fig. 2, spectrum 1) of the stoichiometric NiO film, and the transparency of the NiO_x (x<1) film is much higher in the region λ > 500 nm.

Conclusion. To develop the optimal modes of high frequency magnetron sputtering of thin nickel oxide films used in photovoltaics, we analyzed the optical characteristics of a series of nickel oxide films deposited on silicon and glass substrates. It was found that the main factors influencing the dispersion of the refractive indices *n*(λ) and absorption *k*(λ) of NiO films are the substrate type. Films deposited on silicon substrates have the most optimal properties for use in photovoltaic cells.

The results of the study can be used to correct the conditions for the deposition of nickel oxide films on silicon and glass substrates by high frequency magnetron sputtering with optimal conditions for use in photovoltaics.

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ON THE MINIMAL DEFINITIONS OF QUASILOCAL FITTING CLASSES

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Throughout this paper, all groups are finite. In terminology and notation, we follow monograph [1]. In the theory of classes of finite group, the idea of localization is fundamental. A local method for studying finite solvable groups using radicals and Fitting classes was proposed by Hartley [2].

The idea of Hartley localization consists of study group classes in terms of *p*-groups and radicals defined by mapping (local H-functions or Hartley functions) of the set of all primes $\mathbb{P}$ into sets of Fitting classes.

The σ-method for studying local formation of groups was proposed and the concept of a σ-local formation was introduced in the series of works by Skiba A.N. [3–5]. The method was dualized in the theory of Fitting classes by Vorob'ev N.T. [6].

A natural problem is to generalize the definition of a σ-local Fitting class and its properties obtained in [6]. In particular, the result of Vorob'ev N.T. and Zagurski V.N. on quasilocal Fitting classes, defining the notion of σ-quasilocal Fitting class.

The main goal of this work is to generalize the notion of σ-local Fitting classes and to study the structural properties of generalized quasilocal Fitting classes.

Material and methods. In this paper, localization methods are used in the study of Fitting classes. In particular, methods of the theory of local Fitting classes.

Findings and their discussions. *Class of groups* is a set of groups that, along with each group, contains an isomorphic group. The class of group is called *a formation* if closed under taking factor groups and subdirect products. Class group $\mathfrak{X}$ is called *Fitting class* if closed under taking normal subgroups and products of normal $\mathfrak{X}$-subgroups.

Let $\mathfrak{F}$ is a formation and G is a group. For a non-empty formation $\mathfrak{F}$, every group G has the smallest normal subgroup whose quotient is in $\mathfrak{F}$ which is called *the $\mathfrak{F}$-residual of G* and denotes by $G^{\mathfrak{F}}$.

Let $\mathbb{P}$ is the set of all primes, $\pi \in \mathbb{P}$ and $\pi' = \mathbb{P} \backslash \pi$. If n is an integer, the symbol $\pi(n)$ denotes the set of all primes dividing n. In particular, $\pi(G) = \pi(|G|)$, the set of all primes dividing the order of G. Let σ is some partition of $\mathbb{P}$, that is, $\sigma = \{\sigma_i : i \in I\}$, where $\mathbb{P} = \cup_{i \in I} \sigma_i, \sigma_i \cap \sigma_j = \emptyset$ for all $i \neq j$, $\sigma(n) = \{\sigma_i : \sigma_i \cap \pi(n) \neq \emptyset\}$.

We call any function f on the form $f: \sigma \to \{\text{group classes}\}$ a *Hartley σ-quasilocal function or simply H_{Q_σ}-function.* Denote the set $\Pi = Supp(f) =$ $= \{\sigma_i \in \sigma : f(\sigma_i) \neq \emptyset\}$. Let group class $QLR_\sigma(f) = \mathfrak{E}_\Pi \cap (\cap_{\sigma_i \in \Pi} f(\sigma_i)\mathfrak{E}_{\sigma_i}\mathfrak{E}_{\sigma_i'})$, where $\mathfrak{E}_\Pi$ is the class of all Π-group, $\mathfrak{E}_{\sigma_i}$ and $\mathfrak{E}_{\sigma_i'}$ are classes of all σ_i-groups and σ_i'-groups, respectively.

Definition. A Fitting class is called *σ-quasilocal*, if there is an H_{Q_σ}-function f such that $\mathfrak{F} = QLR_\sigma(f)$. [7]

Note that with minimal partition σ, i.e. $\sigma^1 = \{\{2\}, \{3\}, \dots\}$, σ-quasilocal Fitting class is quasilocal, which was first defined in the work by Vorob'ev N.T. and Zagurski V.N. [7]. Besides, if H_{Q_σ}-function f such that $\sigma = \sigma^1$ and $f: \mathbb{P} \to \{\text{Fitting classes}\}$, then $H_{Q_{\sigma^1}}$-function is the Hartley function or simply H-function.

The properties of σ-quasilocal Fitting classes and methods of their construction represent the following theorems.

Theorem 1. The intersection of any set of σ-quasilocal Fitting classes is a σ-quasilocal Fitting class.

Theorem 2. Let $\mathfrak{F} = QLR_\sigma(\varphi)$ for some normal-hereditary quasilocal H_{Q_σ}-function φ and $\Pi = Supp(\varphi)$. Then $\mathfrak{F}$ has a unique minimal normal-hereditary quasilocal H_{Q_σ}-function f_0 such that

$$f_0(\sigma_i) = \begin{cases} S_n(G \in \mathfrak{F} : G \cong X^{\mathfrak{E}_{\sigma_i}\mathfrak{E}_{\sigma_i'}}(X \in \mathfrak{F})), \text{if } \sigma_i \in \Pi, \\ \emptyset, \text{if } \sigma_i \in \Pi'. \end{cases}$$

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