РЕФЕРАТ

Роботу викладено на 105 сторінках, вона містить 5 розділів, 52 ілюстрації, 28 таблиць і 76 джерел в переліку посилань.

Об’єктом дослідження стали спектральні конвертори на основі нанолюмінофорів для кремнієвих сонячних елементів,

Предмет роботи – дослідження структурних, спектральних та оптичних характеристик синтезованих нанолюмінофорів та плівок спектральних конверторів, дослідження їх впливу на характеристики фотоелектричного перетворювача (ФЕП).

Метою даної роботи є синтез та дослідження нанолюмінофорів на основі Y_2O_3:Eu, що здійснюють перетворення сонячного спектру за механізмом даун-шифтингу, для застосування у складі плівки ЕВА кремнієвих сонячних елементів.

В першому розділі подано огляд літератури, в якому розглядається теоретичні основи спектральної конверсії.

В другому розділі роботи проводився аналіз матеріалів, технологічних методів синтезу нанолюмінофорів, та їх впровадження у плівки та був зроблений огляд основних параметрів нанолюмінофорів та легованих плівок.

В третьому розділі наведений синтез нанолюмінофорів та плівок на їх основі, аналіз структурних, спектральних та оптичних характеристик.

В четвертому розділі було проведено дослідження впливу плівок, легованих нанолюмінофорами, на характеристики ФЕП.

В п’ятому розділі було представлено розробку стартап проекту.

СПЕКТРАЛЬНІ ПЕРЕТВОРЮВАЧІ, ЕВА, ДАУН-КОНВЕРСІЯ, ДАУН-ШИФТІНГ, АП-КОНВЕРСІЯ, РЗЕ, ЛАНТАНОЇДИ, НАНОЛЮМІНОФОРИ, ФЕП.

ABSTRACT

The work presented on 105 pages consists of 5 parts, 52 figures, 28 tables and 76 sources in the list of references.

Nanophosphors based spectral converters for silicon solar cell were the object of the study.

The subject of the work - research structural, spectral and optical properties of synthesized nanophosphors and nanophosphors doped films, research of the effect of the films on the characteristics of solar cell (SC).

The purpose of the work is the synthesise and research Y_2O_3:Eu based nanophosphors, what perform down-shifting conversion of solar spectrum, for further implementation into EVA films for silicon solar cells.

The first chapter provides a literature review, which addresses theoretical basics of spectral conversion.

In the second section of the review common materials, technological synthesis methods of spectral conversion nanophosphors and their implementation inside films as well as main properties of nanophosphors and nanophosphors doped films were discussed.

The third section includes synthesis of nanophosphors and nanophosphors doped films, analysis of structural, spectral and optical properties.

The fourth section includes the study of the impact of the nanophosphors doped films on the characteristics of solar cells.

In the fifth section, startup project was presented.

SPECTRAL CONVERTERS, EVA, DOWN-CONVERSION, DOWN-SHIFTING, UP-CONVERSION, RE, LANTANIDES, NANOPHOSPHORS, SOLAR CELL.

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