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(54) Title: NEW PHOTOTHERAPEUTIC MATERIALS PREPARED THROUGH NANOPARTICLE ASSEMBLY

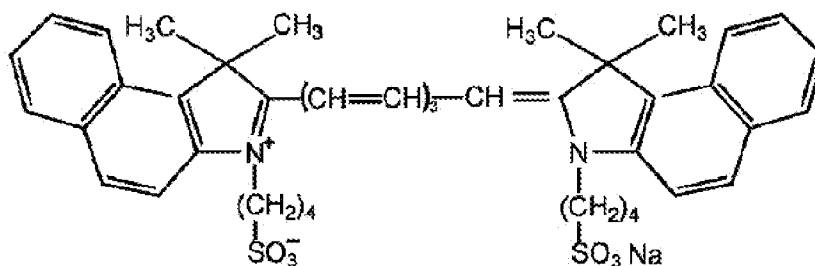


FIGURE 2

(57) Abstract: Novel phototherapeutic methods and compositions are described herein. Nanoparticle-assembled microcapsules as a new type of delivery vehicle for photosensitive compounds may be synthesized through a two-step assembly process. Charged polymer chains and counterions may be combined with a photosensitive compound to form photosensitive aggregates, and then nanoparticles may be combined with the aggregates to form the microcapsules. The shell may be composed of nanoparticles and/or polymer, and the core interior may contain the photosensitive compound. Formation occurs rapidly (on the order of seconds) and the conditions are very mild (at room temperature, in aqueous solution, and at neutral pH). The microcapsule synthesis is highly suitable as an encapsulation method, particularly for a charged photosensitive molecule like ICG.

WO 2008/088586 A3

## INTERNATIONAL SEARCH REPORT

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## A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61K 41/00 (2008.04)

USPC - 424/451, 424/452, 424/458, 424/462, 604/20

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC(8) - A61K 41/00 (2008.04)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

IPC(8) - A61K 41/00 (2008.04)

USPC - 424/451, 424/452, 424/458, 424/462, 604/20 (keyword search)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PUBWEST, Google Scholar: photosensitive, photoactive, photocurable, dye, polyelectrolyte, microshell, microcapsule, microsphere, nanoparticle, core, layer, coat, encapsulate, indocyanine green, indol, carbocyanine, polymethine, azido, acridine, anthraquinone, benzimidazol, indolenine, sodium hydrogen phosphate, amine ratio

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2004/0156783 A1 (Rajagopalan et al.) 12 August 2004 (12.08.2004), para [0003]; [0013]; [0020]; [0023]; [0036]; [0042]; [0056]; [0057]; [0060]; [0065]; [0066]; [0078]; [0079]; [0082]	1-25
Y	US 2006/0159921 A1 (Murthy et al.) 20 July 2006 (20.07.2006), para [0001]; [0010]; [0011]; [0012]; [0015]; [0016]; [0029]; [0032]; [0033]; [0035]; [0037]; [0039]; and [0043]	1-25
Y	US 4,692,462 A (Banerjee) 08 September 1987 (08.09.1987) col 1, ln 6-13; col 3, ln 11-16	24
A	US 2005/0202096 A1 (Li et al.) 15 September 2005 (15.09.2005), entire document	1-25
A	US 2004/0013721 A1 (Antipov) 22 January 2004 (22.01.2004), entire document	1-25

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"P" document published prior to the international filing date but later than the priority date claimed

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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